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1946

FIFTY-SEVENTH YEAR OF PUBLICATION

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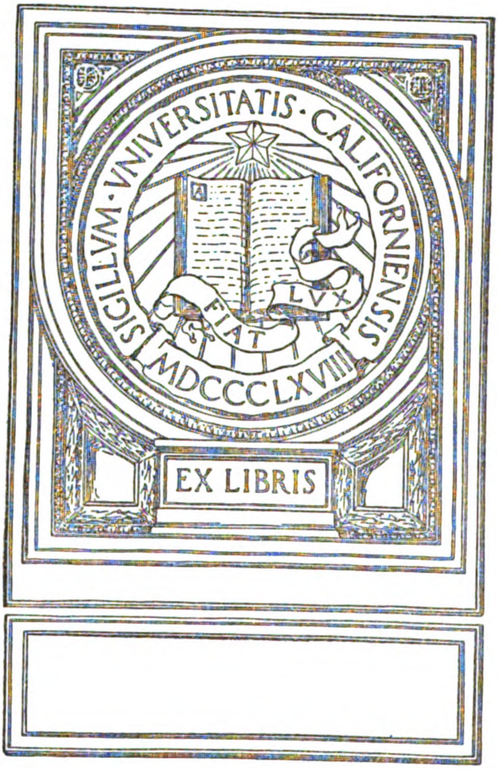

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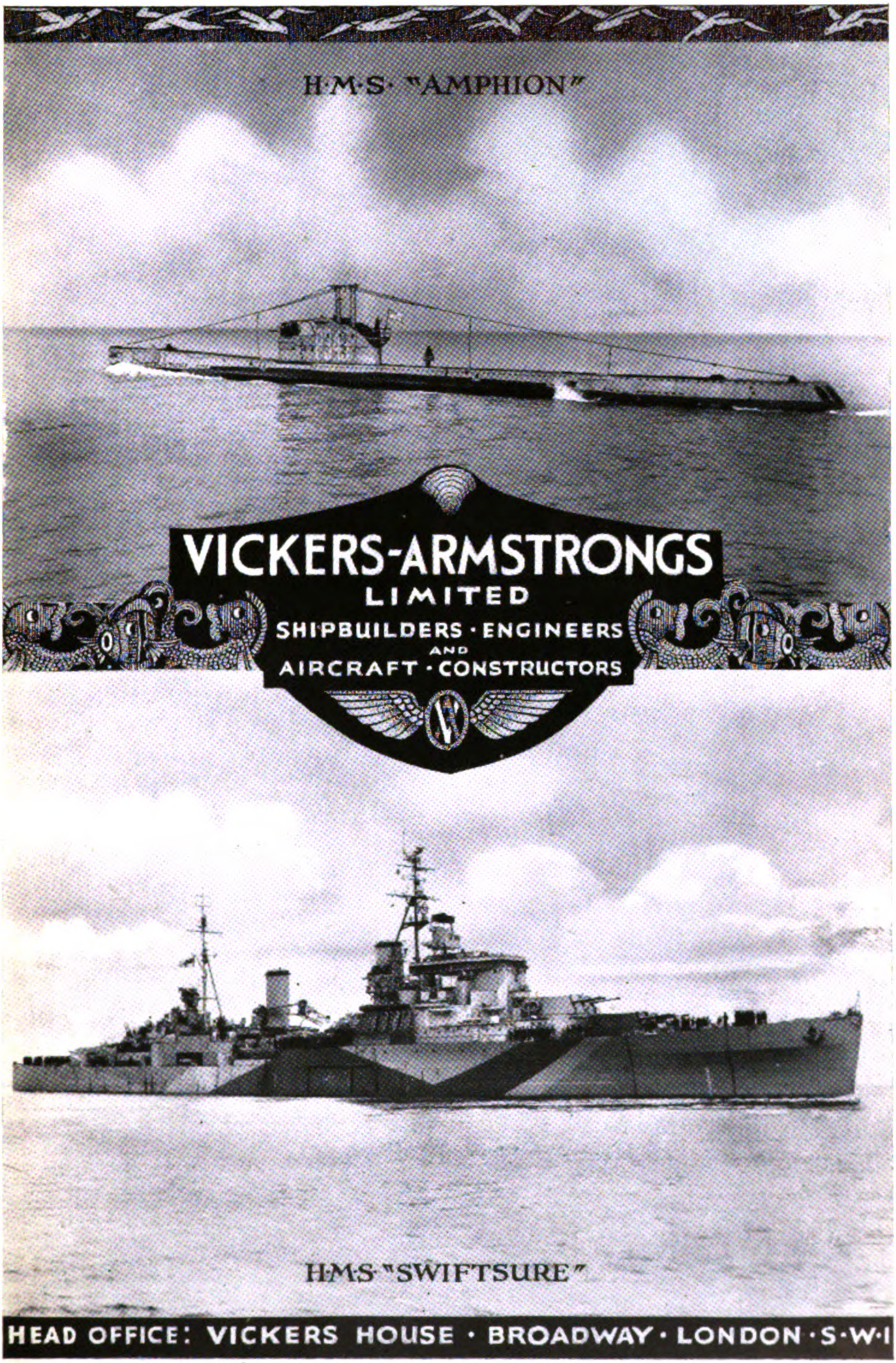

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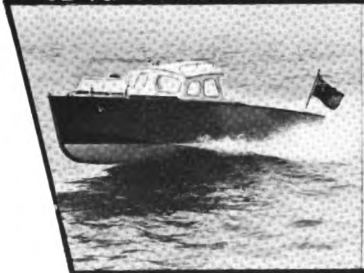

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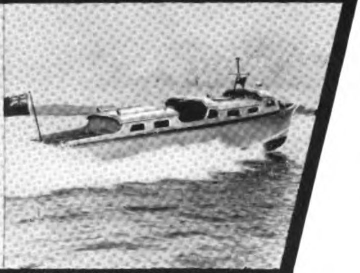

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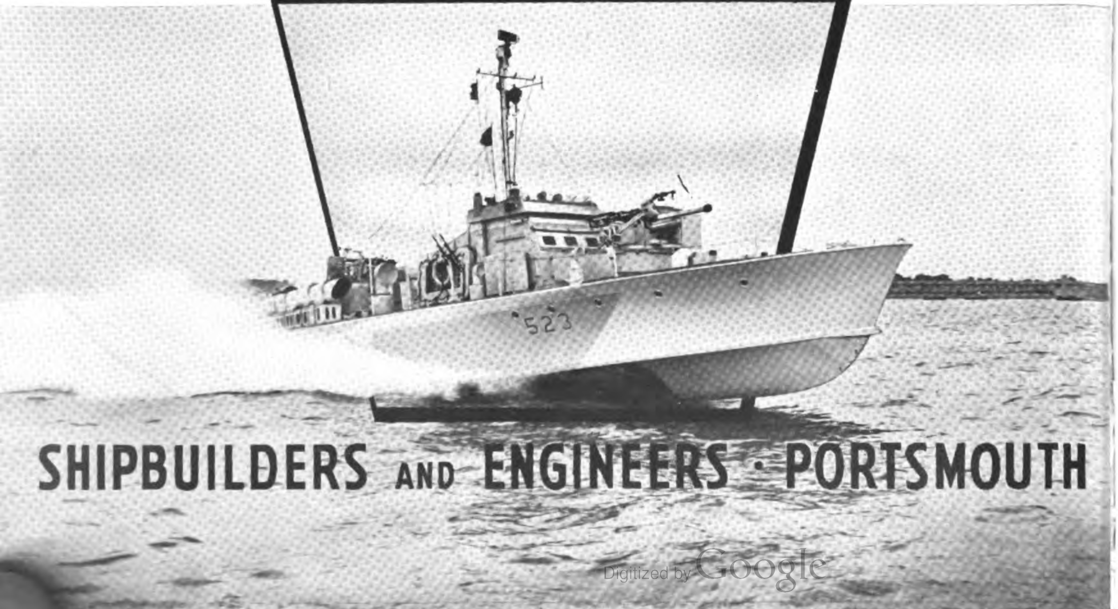

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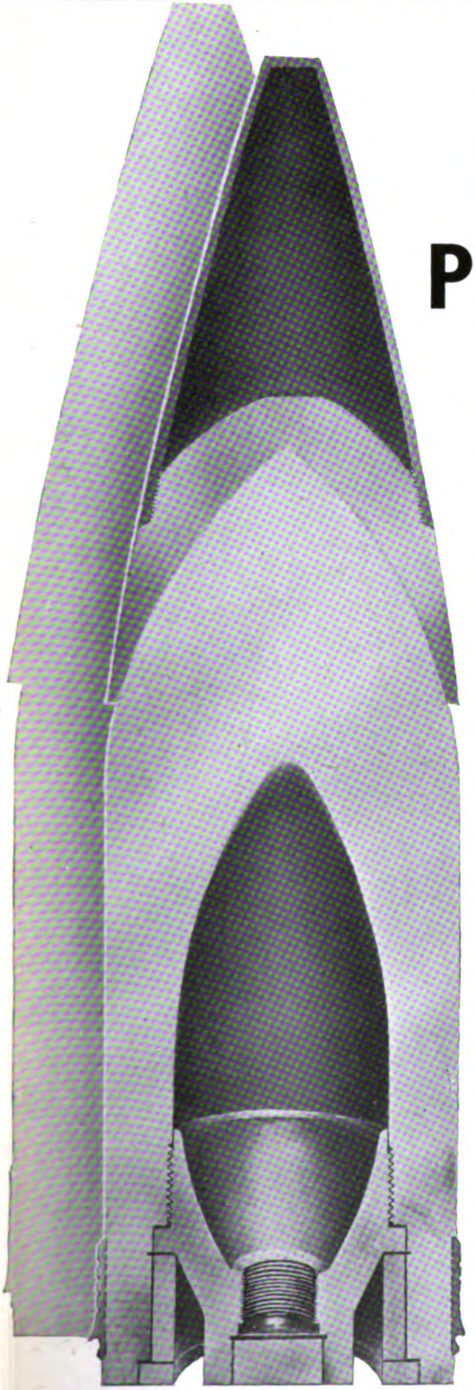

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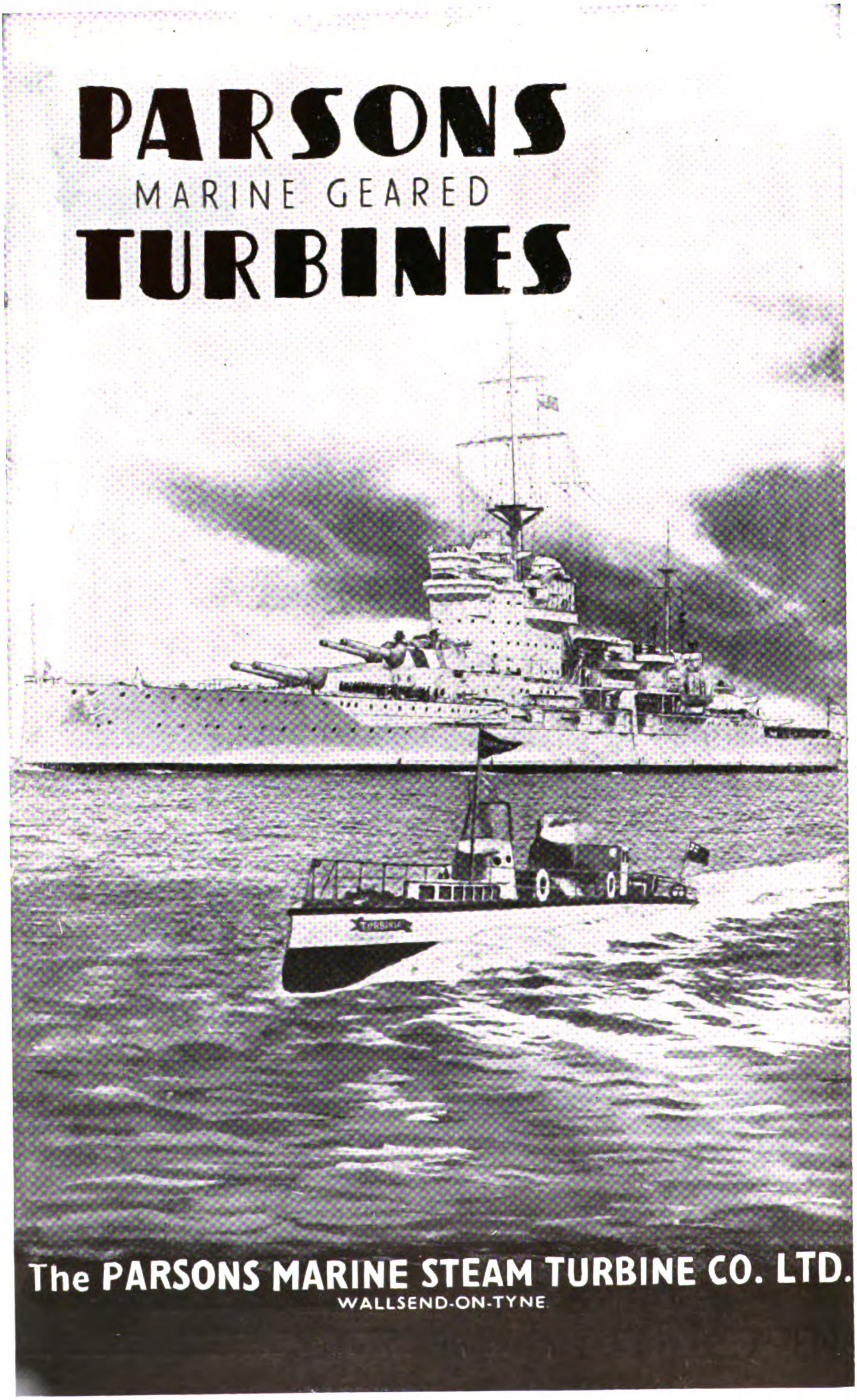

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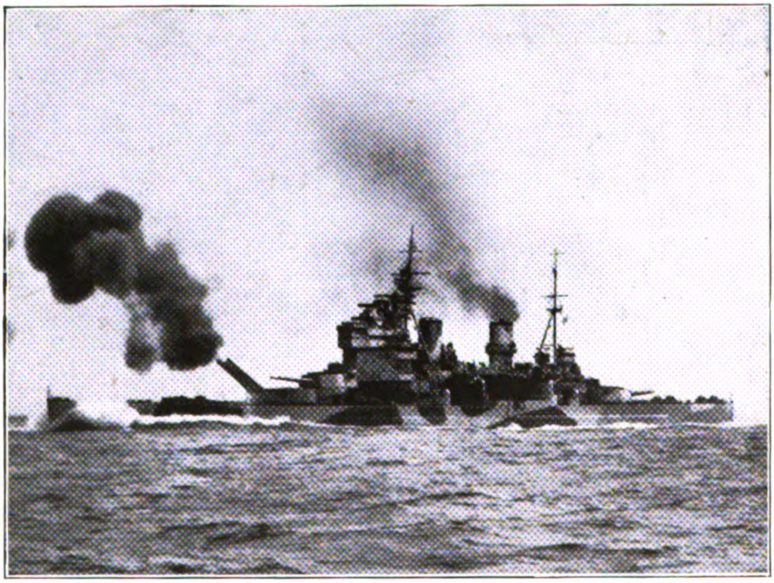

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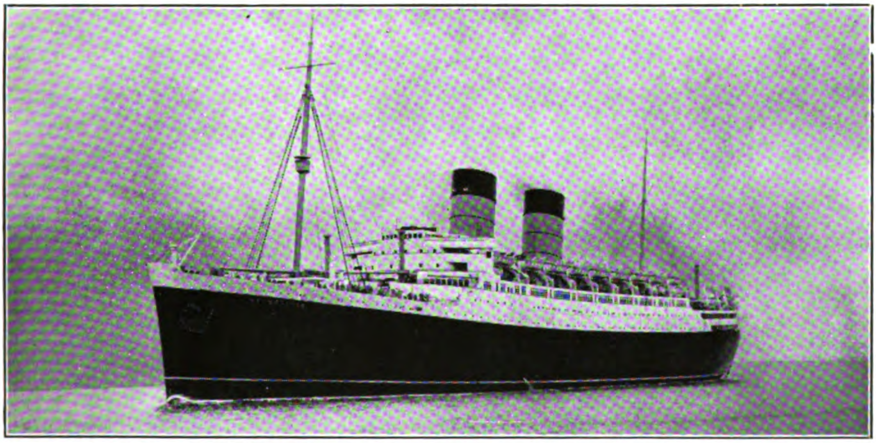

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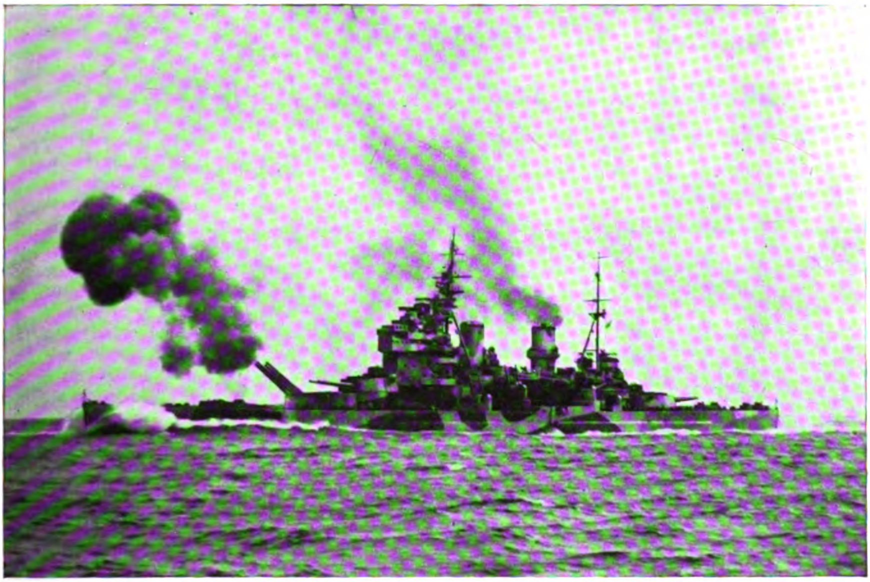

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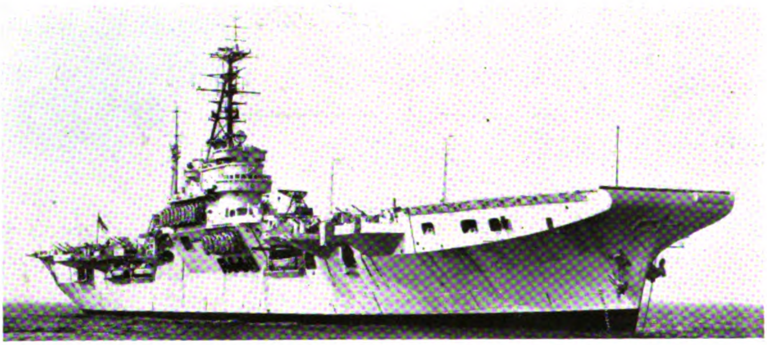

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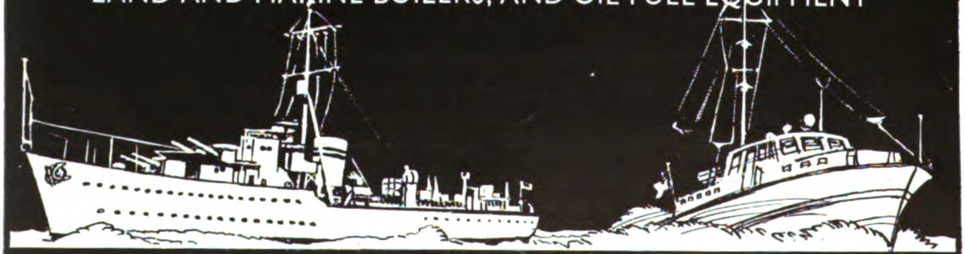

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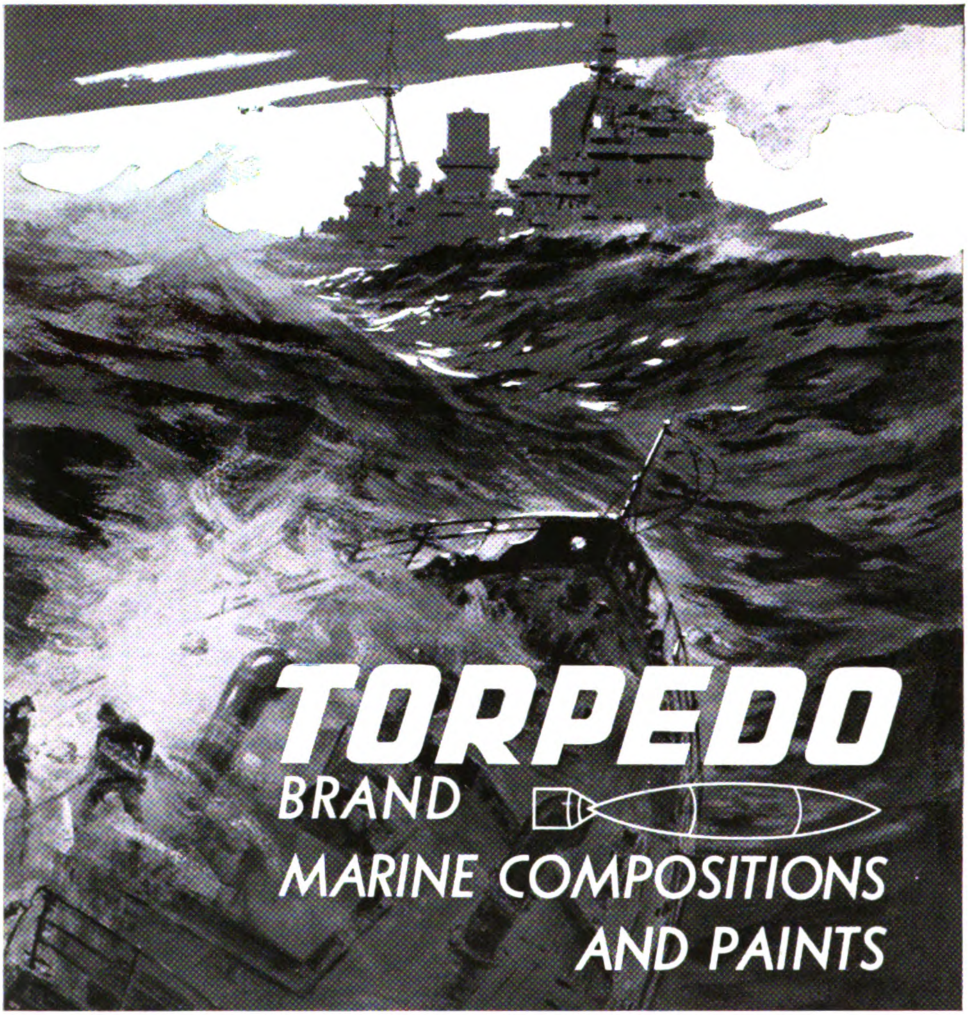

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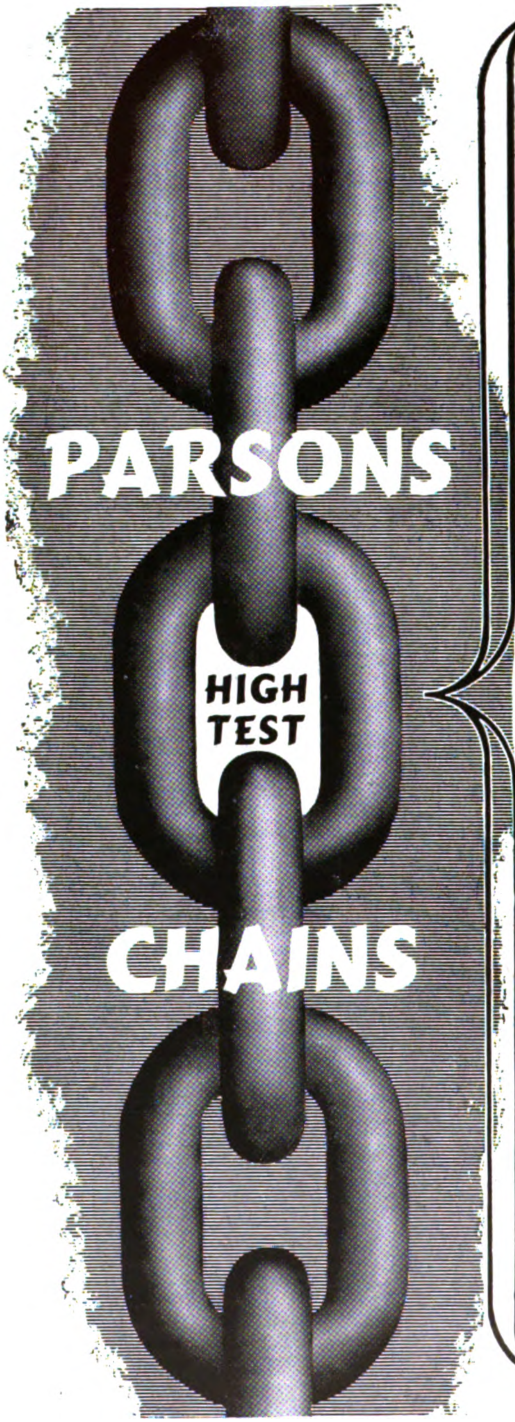

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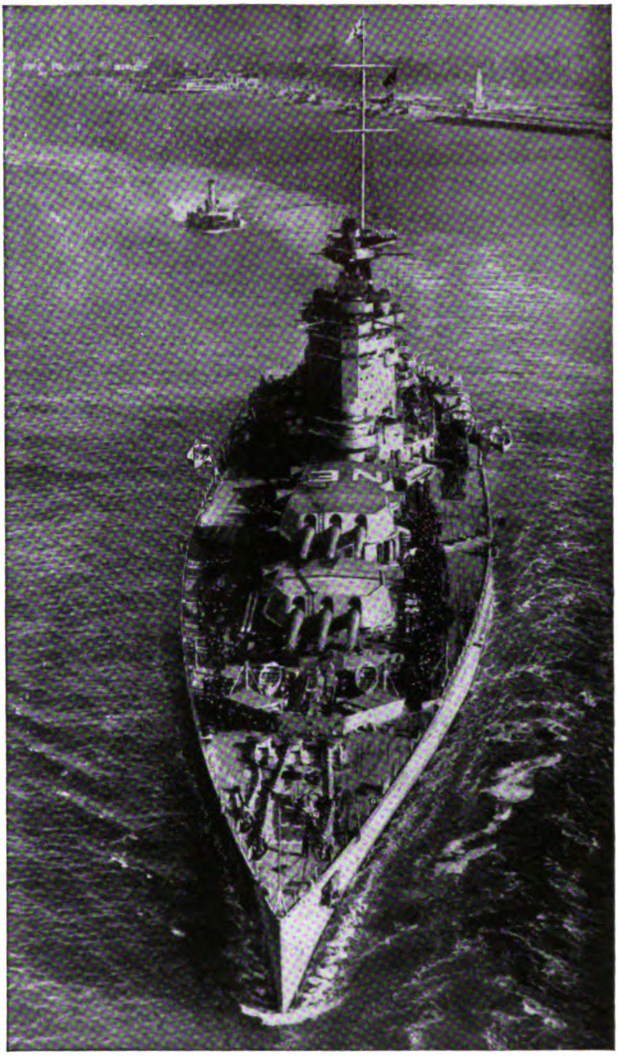

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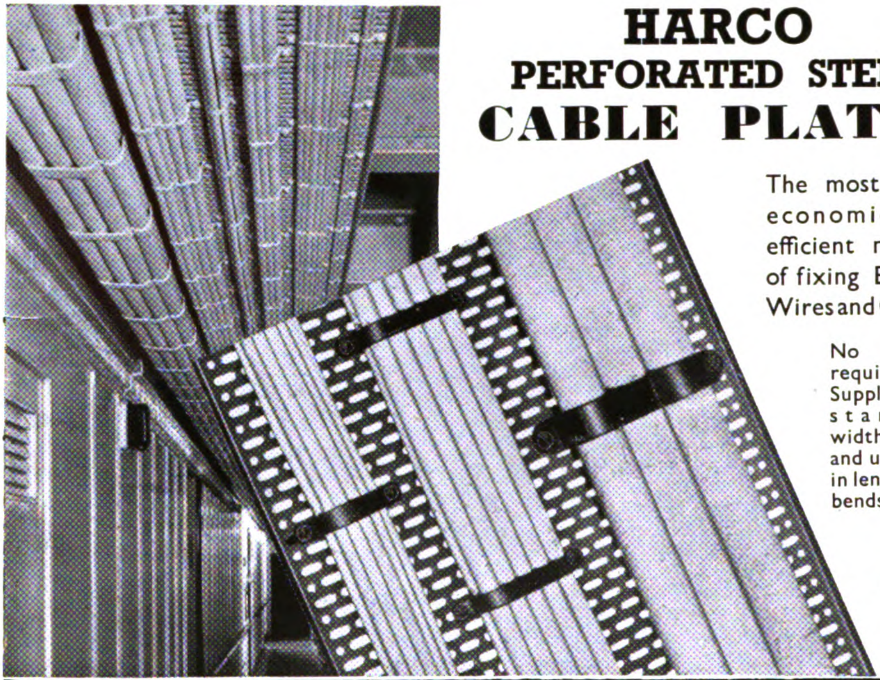

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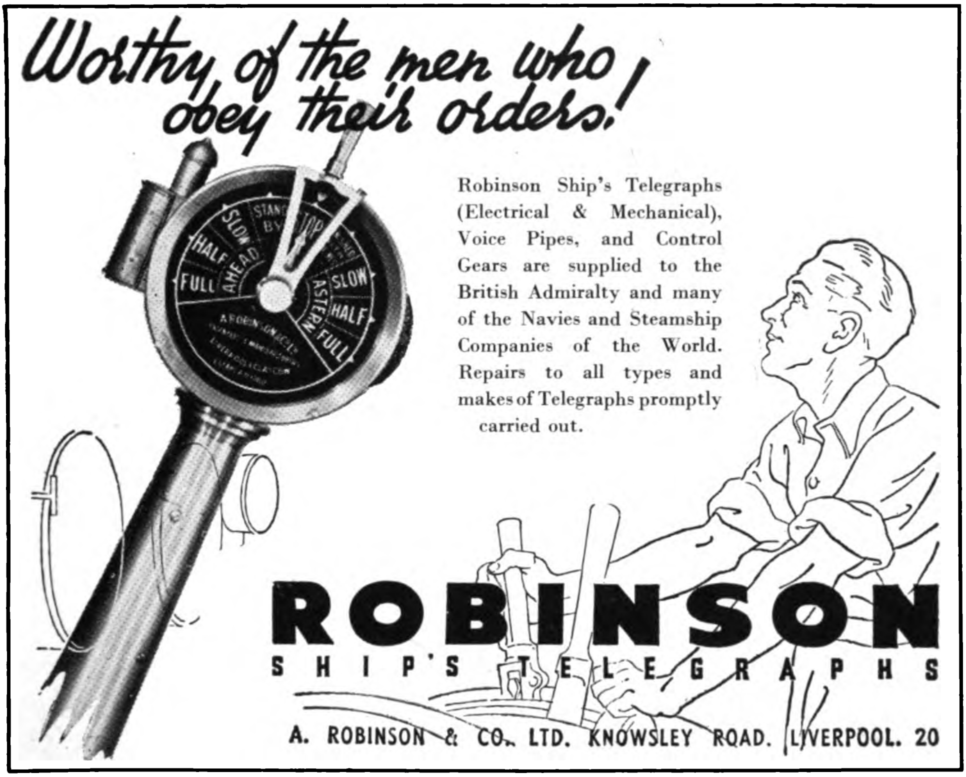

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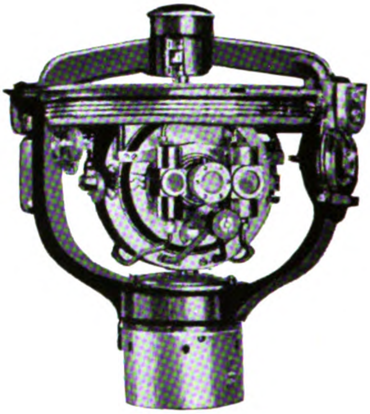

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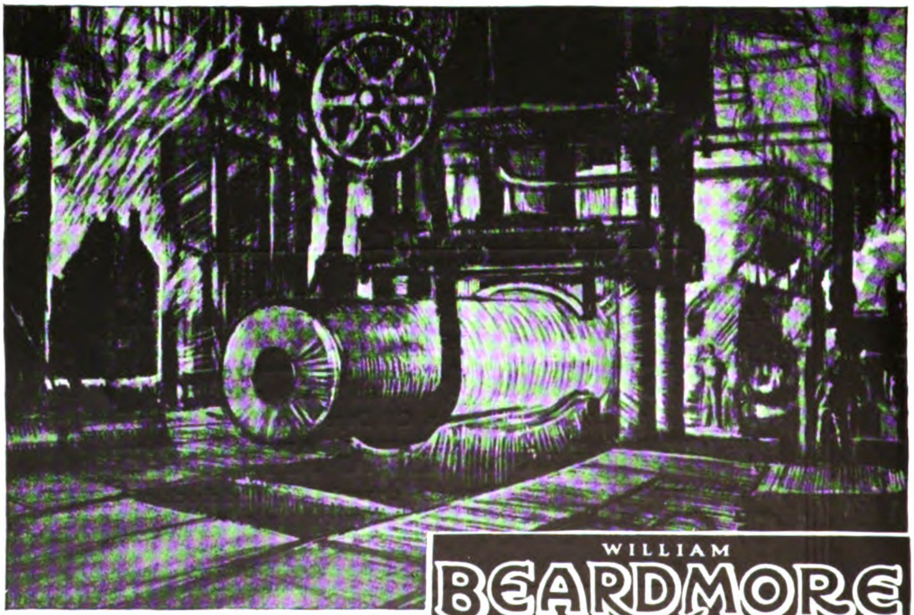

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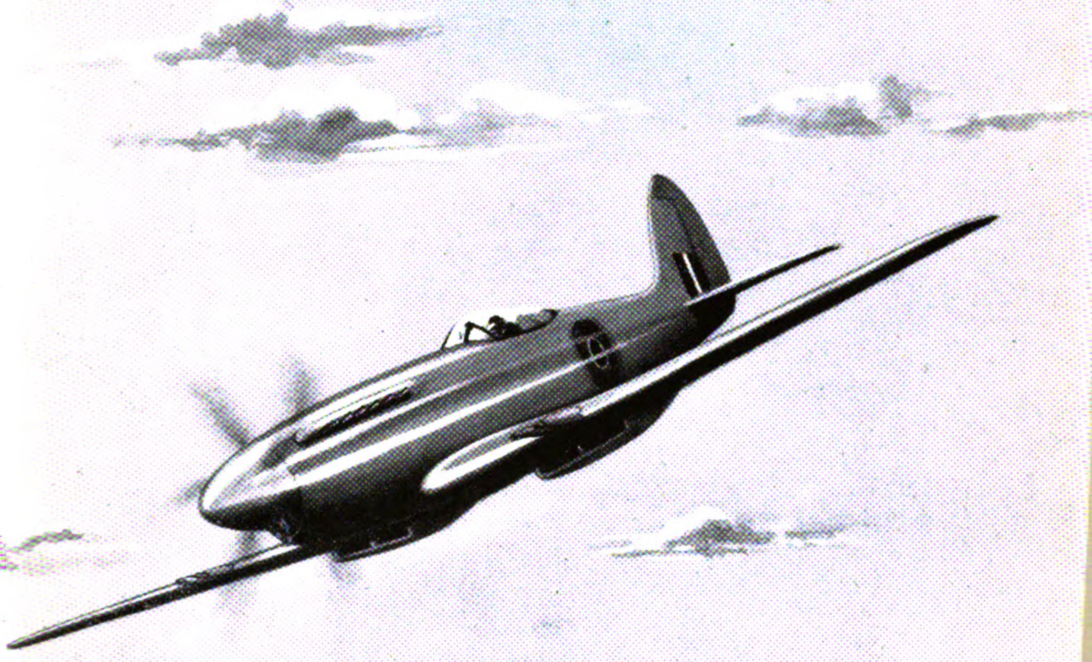

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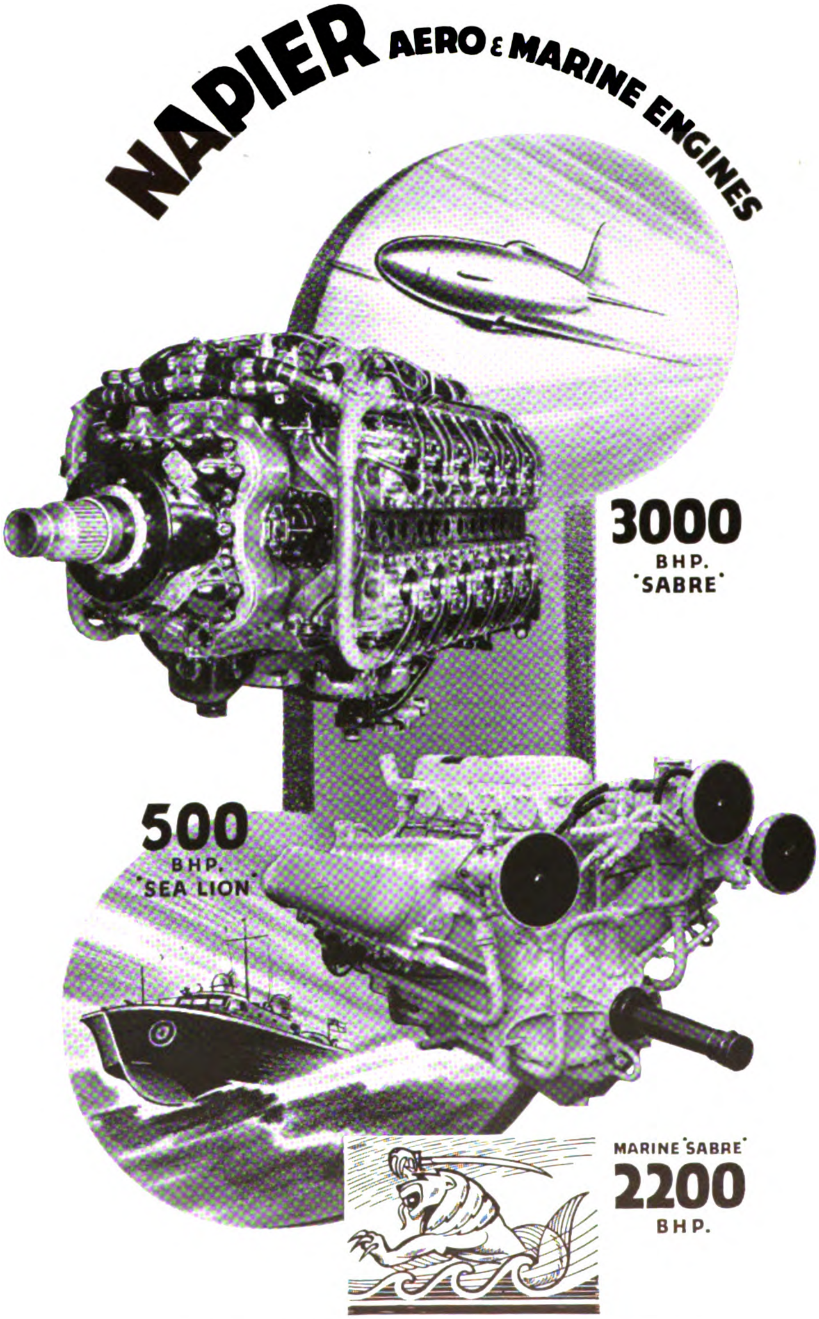

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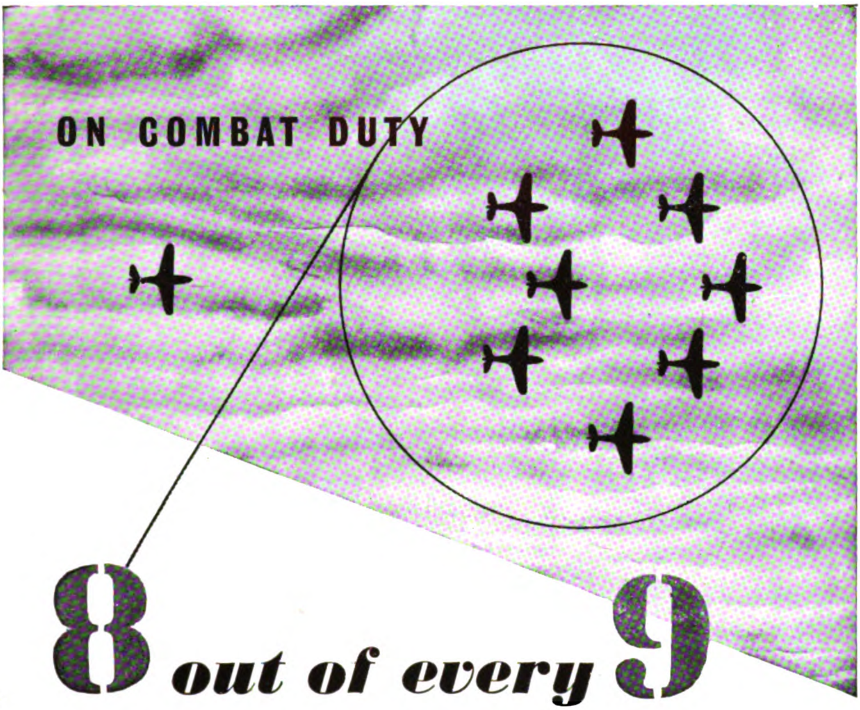

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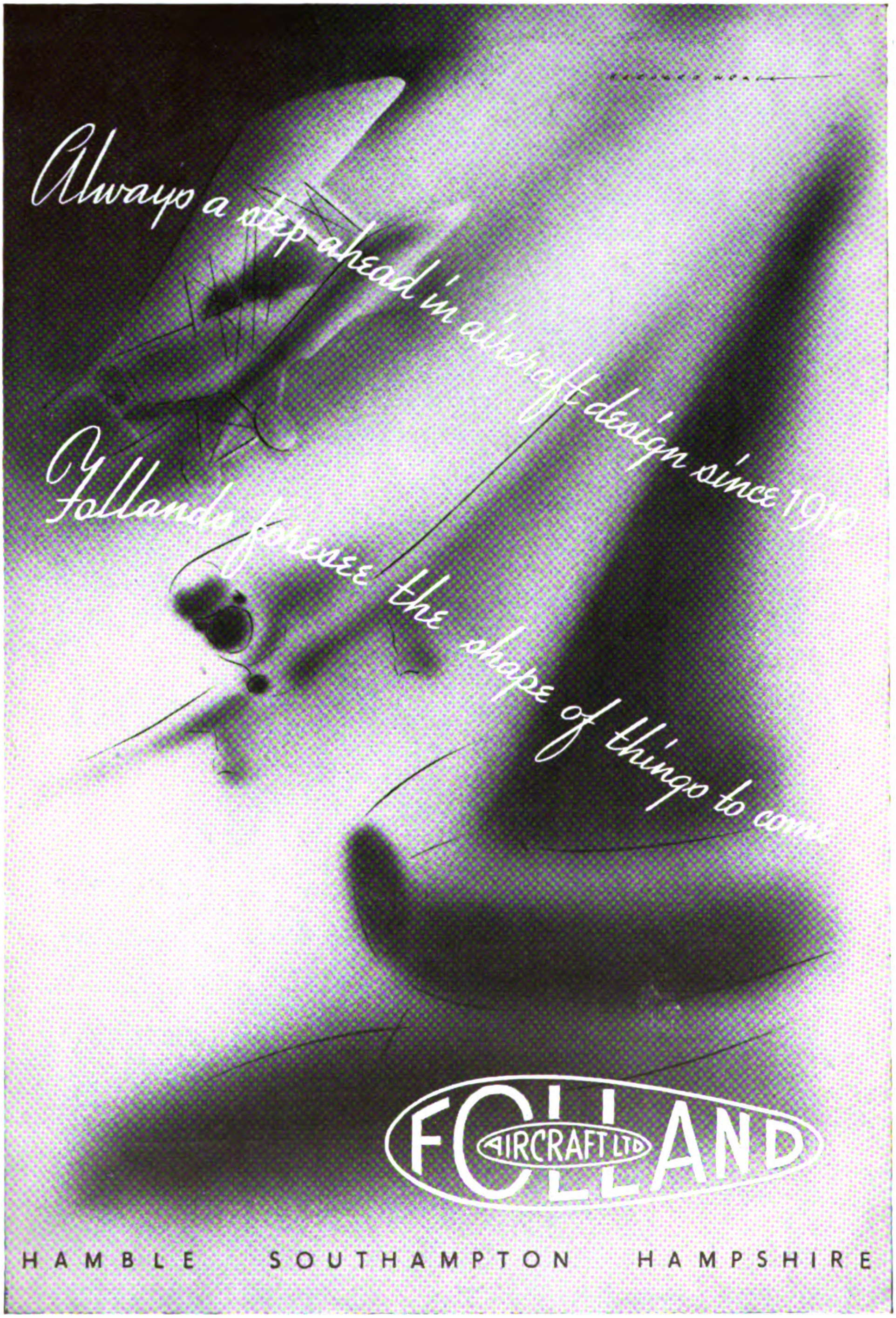
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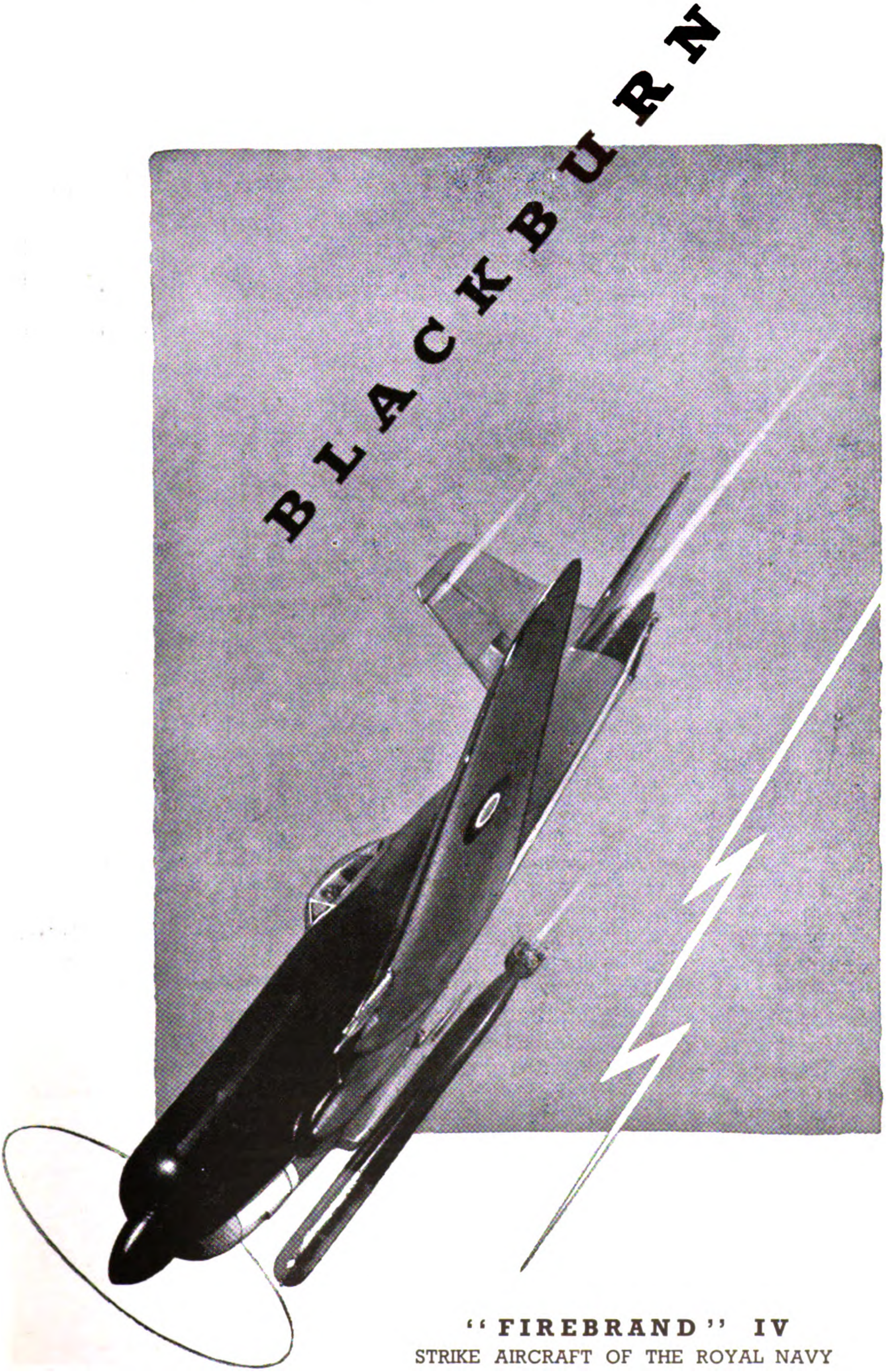

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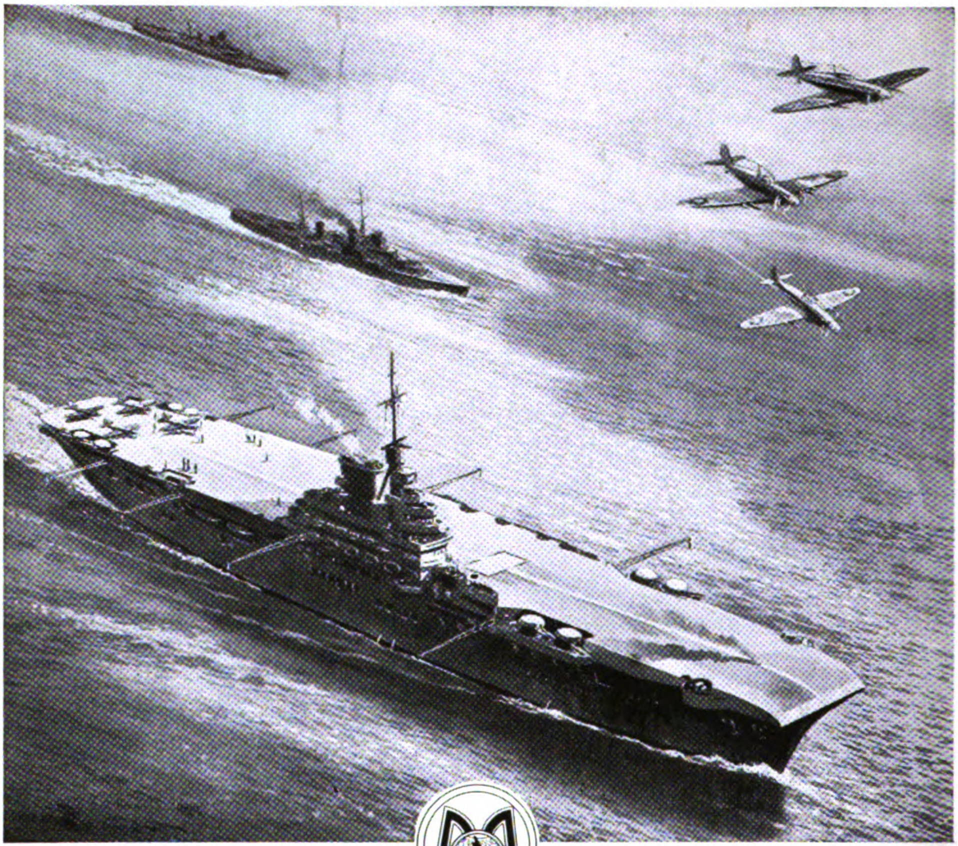

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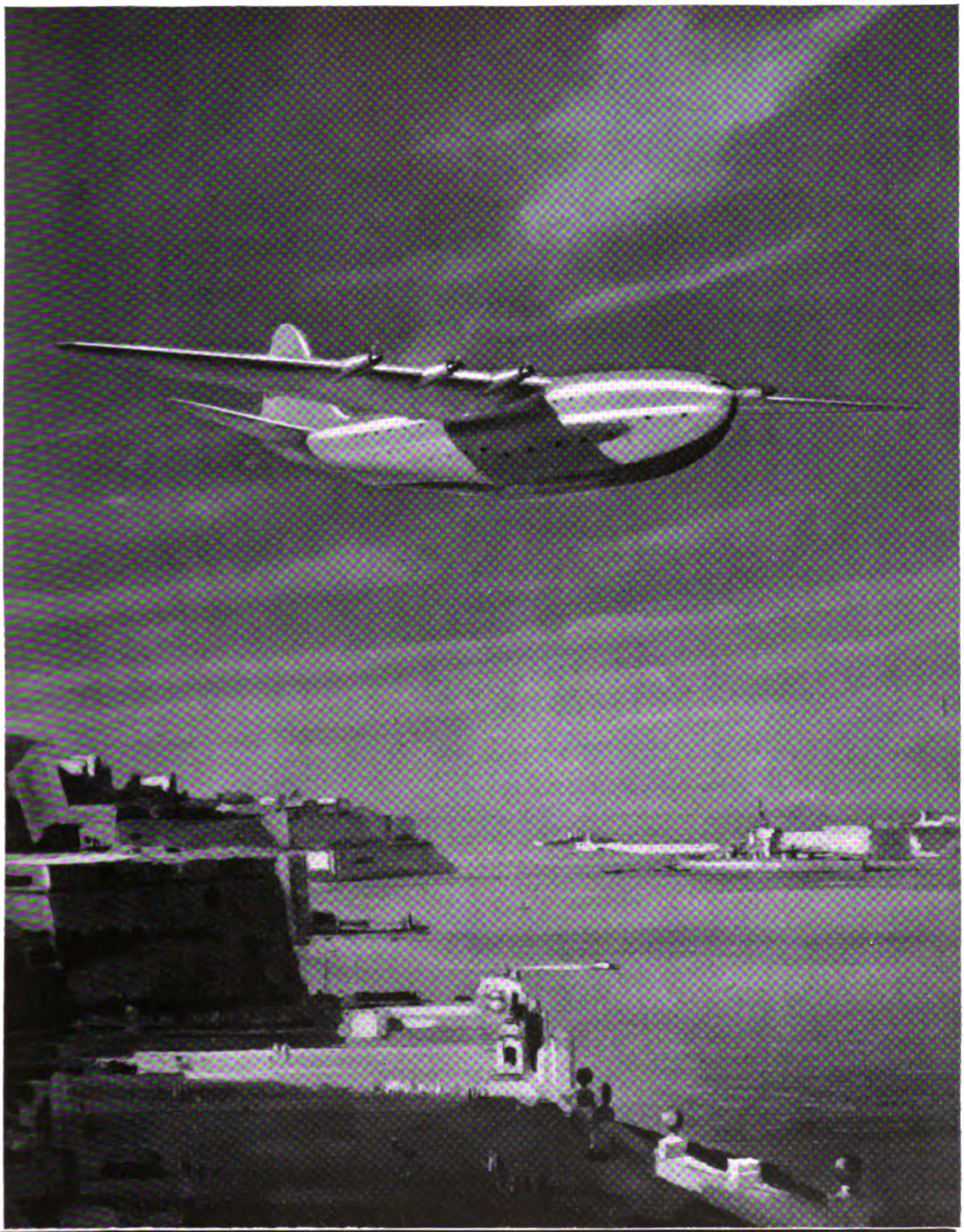

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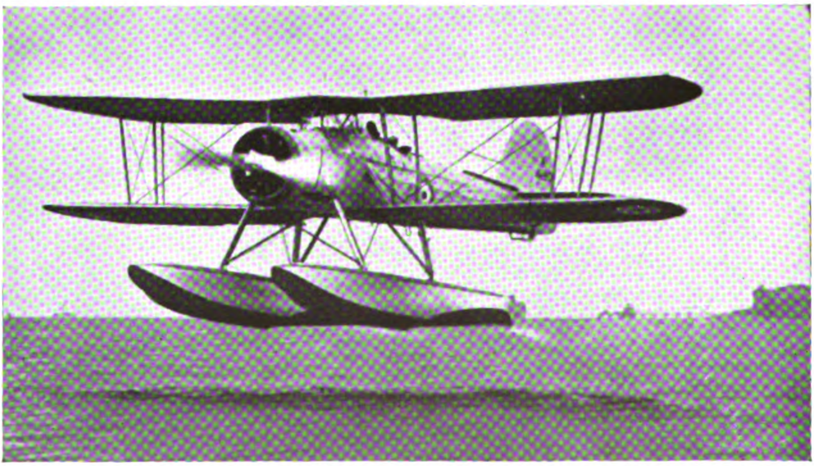

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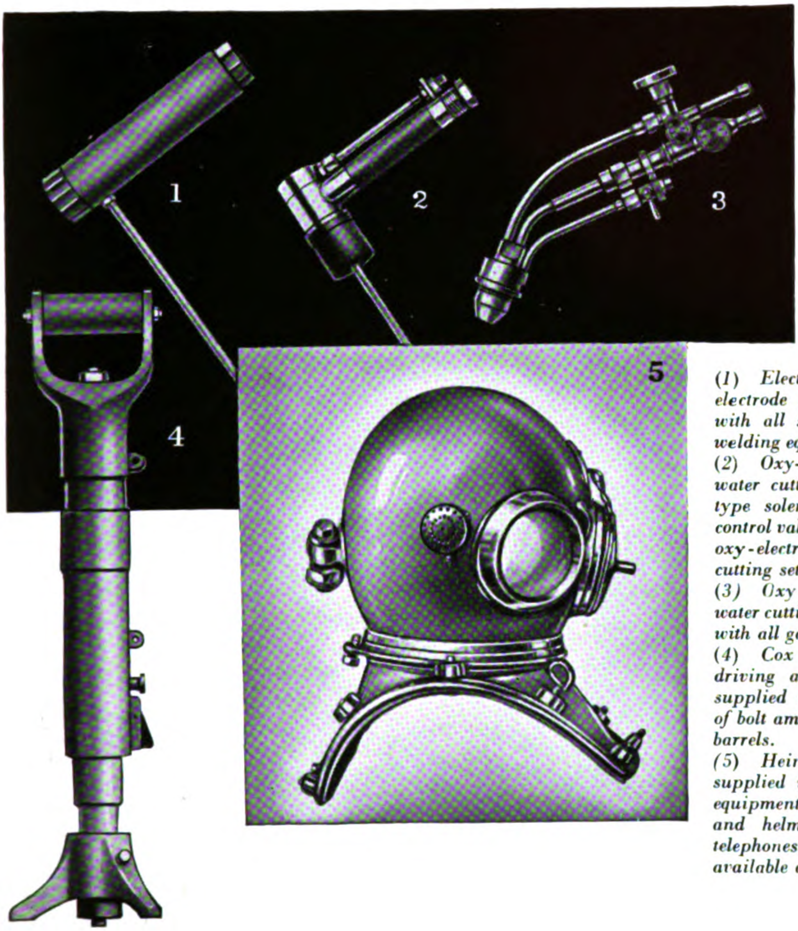

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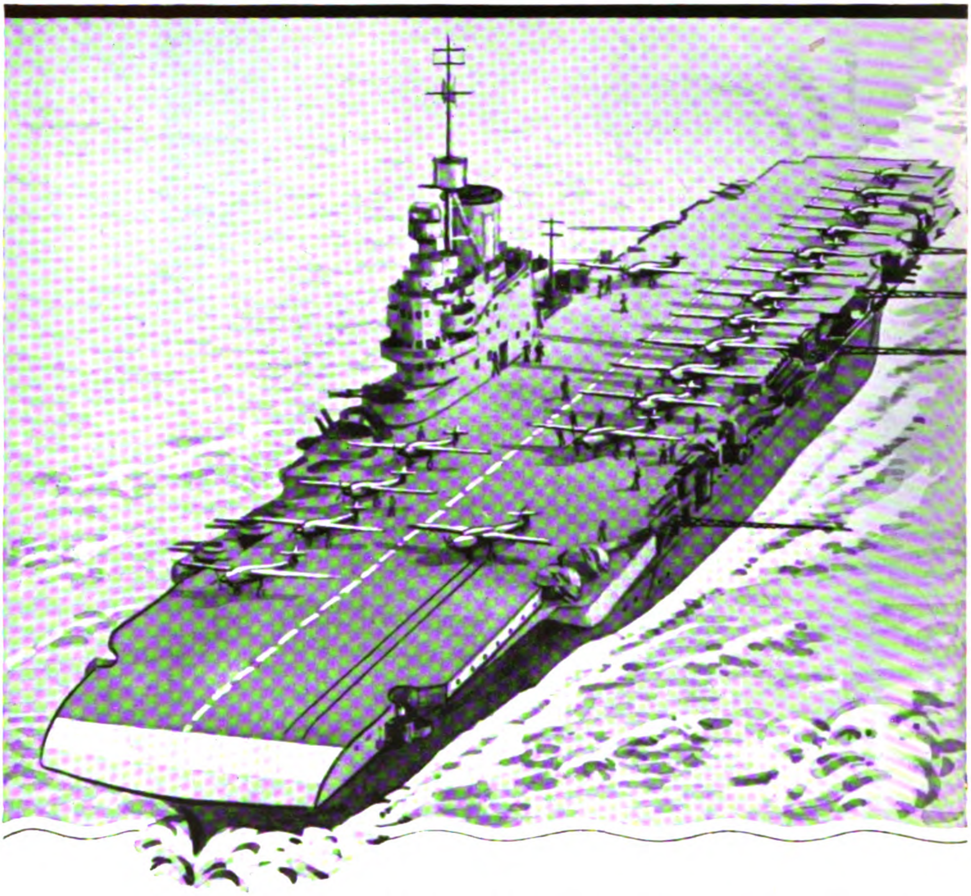

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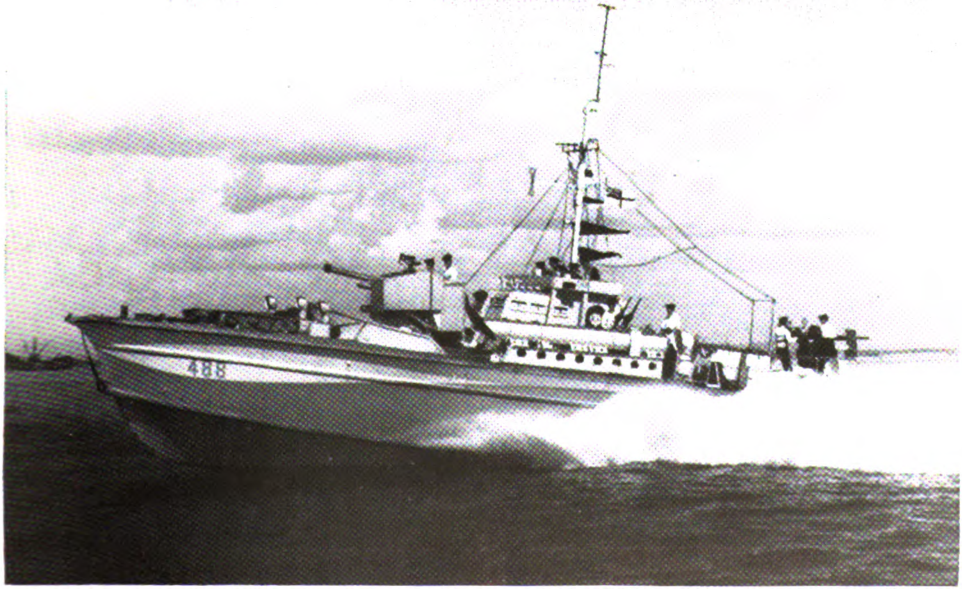

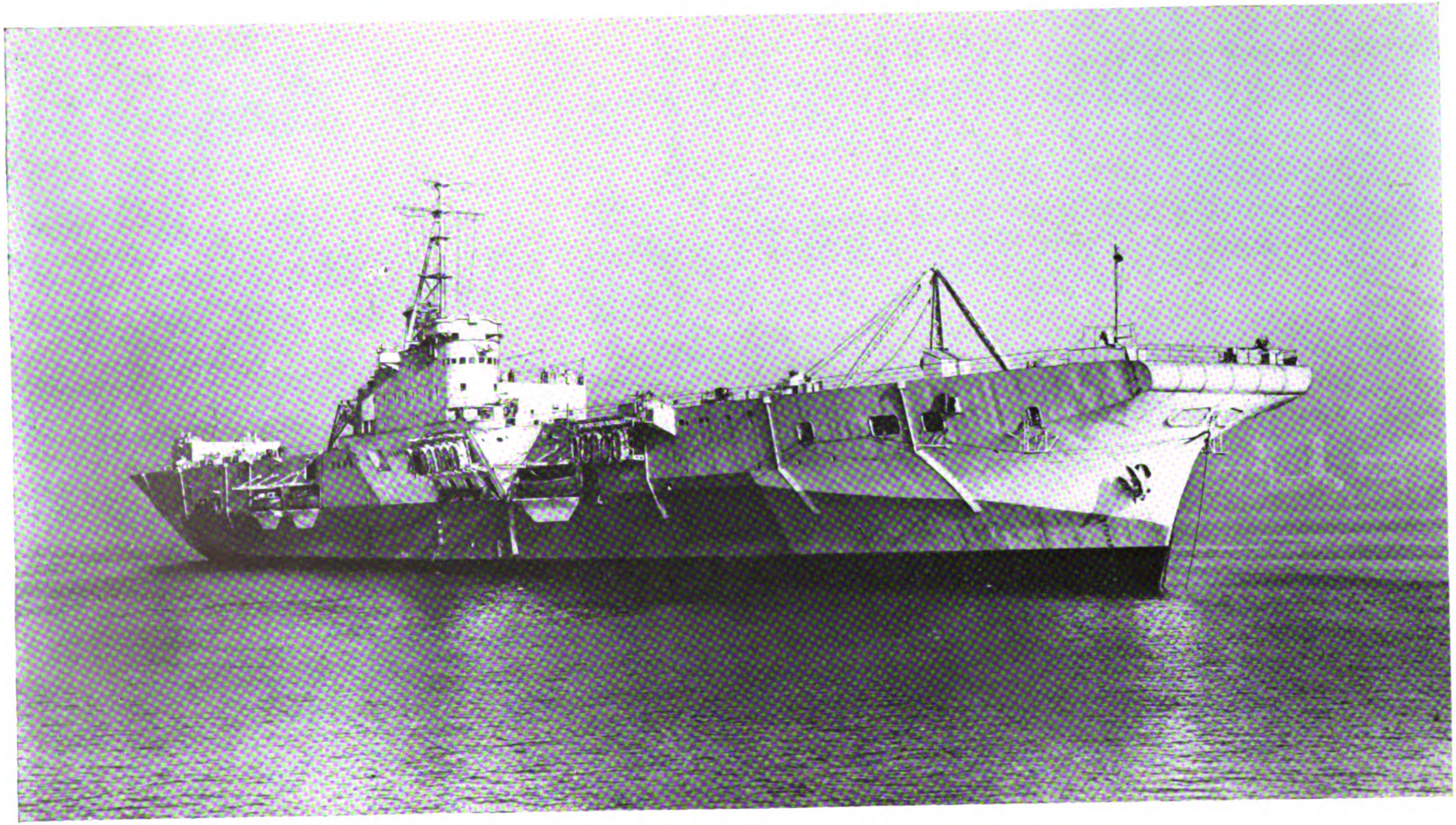

Frontispiece

H.M.S. "PIONEER"

Constructed by Vickers-Armstrong Ltd., Naval Construction Works, Barrow-in-Furness.

BRASSEY'S
NAVAL ANNUAL
1946

Edited by
REAR-ADMIRAL H. G. THURSFIELD

FIFTY-SEVENTH YEAR OF PUBLICATION

WILLIAM CLOWES & SONS, LIMITED
LONDON
THE MACMILLAN COMPANY
NEW YORK

MADE AND PRINTED IN GREAT BRITAIN
BY WILLIAM CLOWES AND SONS, LTD.,
LONDON AND BECCLES

V10
N3
1946

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PREFACE.

The Great War—World War II, as it is styled across the Atlantic—is over, but the difficulties and delays imposed by war conditions on the compilers and producers of books of reference are still with us, in the United Kingdom at least. In consequence, it has become necessary to revert to the practice of many years ago, and publish " Brassey's Naval Annual " for this year on Trafalgar Day—October 21—or as soon after that date as may be. This is an appropriate date from a sentimental point of view, though later than would be chosen, but for practical difficulties, for an Annual which perforce deals largely with the events of the preceding year. The subject matter in " Brassey's Naval Annual," however, has never been confined to a mere record of past events ; it has also commonly included analysis of their course, with a view to drawing conclusions that shall be of use in the future, together with reviews of present conditions with the same object in view. Above all, it has been my endeavour, in common with my predecessors in the editorial chair, to carry on the tradition established by the Founder of endeavouring to keep before the British public the paramount importance of the national well-being of the maintenance of British sea power, and to foster an abiding sense of that need. From that point of view, postponement in publication until a date in the autumn is unimportant.

World War II has seen the rise of the United States Navy to the first position amongst the navies of the world, a position which it is likely to retain in the future, as far ahead as any student of politics to-day can foresee. That development is not viewed with any jealousy or apprehension in this country—it was inevitable as soon as the bulk of the American people should realise the naval responsibilities thrust upon them by their development into the greatest Power in the world. Moreover, we realise that this growth has taken place in a period throughout which the Royal Navy and United States Navy have been operating in the closest collaboration, sharing every material secret as they share the same political ideals of freedom and justice, and working, in every ocean, as if they were units of the same Service. American sea power constitutes no threat to British security, for it is employed towards the same ends.

The subject matter of this year's " Brassey " falls into two categories: the survey of the course of the late war is carried on to its conclusion ; and past and present conditions are analysed for the guidance they can give to future politics. In the first category are Captain Altham's Chronicle of the War at Sea, Dr. Rosinski's analysis of the Strategy of Japan, Commander Stitt's essay on the Planning of Combined Operations, and Mr. Hurford's summary of war losses. Mr. McMurtrie again contributes a comprehensive summary of the present state of the world's Navies, which is elaborated in greater detail for the French post-war Navy by M. H. Le Masson. M. Le Masson, whose accession to the contributors to " Brassey " I welcome warmly, recently succeeded the late Commandant Vincent-Brechignac as editor of our French contemporary " Les Flottes de Combat."

The growth of naval air operations, not only in the late war—of which Major Stewart again writes—but from its beginnings a quarter of a century ago, is surveyed by " Volage " and Air Commodore MacLean, from slightly different aspects ; and Major Stewart's chapter partakes of the nature of both categories in that he uses his survey of six years' air war at sea to draw lessons for the future. The latter object is also pursued by Sir Archibald Hurd in his call for the full restoration of the British shipping industry, and my own opening chapter on the naval lessons of the war in general.

At the time of going to press, the results of the naval tests of the atomic bombs at Bikini are not available, and indeed the long reports of the investigations made into the two bombs dropped on Japan in August, 1945, have only just been published. There is, therefore, no material yet available for discussion of the outcome of these tests, from the naval point of view, or for an estimate of their effect on the future development of navies and of ships-of-war. Those must await a subsequent issue.

The Reference Section has again been revised by Mr. W. G. Warren, to whom my thanks are due. The lists of ships cannot be referred to a particular date, as has been the practice hitherto, by reason of the difficulty of obtaining authentic figures from Government Departments still largely obsessed with war-time habits of secrecy. They represent rather the peak strengths reached by the various Navies at or near the end of the war, for although large numbers of ships have been laid up or scrapped since hostilities ceased, the exact course and extent of that process has not yet been made public. The German and Japanese lists have been omitted altogether this year, for those Navies are now things of the past. Apart from them, it has been the endeavour to assemble, as completely as possible, all those naval statistics which have been made, or allowed to become, public property.

In conclusion, I desire to acknowledge with appreciation and thanks the courtesy and assistance of all those who have supplied the information and data for which they have been asked.

H. G. THURSFIELD.

CHAPTER I.

THE LESSONS OF THE WAR.

It is not possible, so soon after the conclusion of the war, to write with any confidence of the naval policy of this country or that, for nobody yet knows what those policies will be. They depend on two sets of circumstances, the political and the technical. With the political, a periodical like "Brassey's Naval Annual," devoted chiefly to one Service, is not specially concerned, at any rate until the stage is reached of translating political principle into technical practice. It may be, for instance, that in the fullness of time national navies, armies, and—where they exist separately—air forces, will be replaced by an international force wielded by the United Nations Organisation. If and when that stage is reached, the Admiralties and Ministries of Marine of the world will have to adapt the administration of the forces they raise, maintain, and control to the new status those forces will have to adopt; and the naval problems proper for discussion in a Naval Annual will be different from those that engage our attention today. But that political development has not yet come about, and the Admiralties of the world in those countries which are still in a position to possess and maintain navies, are still concerned with the provision and development of national navies of the type the world has known up to now. The United Nations Organisation is still, as statesmen of many nations are careful frequently to emphasise, in its infancy; it may, as most people hope it will, prove to be a more effectual instrument of world organisation than did its predecessor, the League of Nations. But no Government today is yet entitled to assume that that desirable development is inevitable and certain; or, acting on that assumption, to divest itself of defence forces which it possesses and on which, in the world conditions that have existed up to now, its national security depends. The world has had a warning and an object lesson on the danger of that sort of proceeding in the events of the twenty years preceding the outbreak of the late war, when political theorists in the peace-loving countries, hypnotised by the phrase "collective security" and without any realistic examination of what those blessed words really meant, starved their defence forces—the British Navy in particular—to a point where, when the crash came, they were barely able to discharge the responsibilities then thrown on them. That mistake, it is to be hoped, will not be repeated by this generation.

It follows, therefore, that the naval problems facing the Admiralties today do not differ in kind—from the political point of view at least—from those to which they are well accustomed. Admiralties, and Service Ministries in general, are compelled to adopt in this province an attitude which may well appear somewhat cynical. They must assume that wars are likely to occur in the future, as they have in the past, and they must be prepared to wage them successfully. It is not for them to assume that, as everybody must hope, wars are a thing of the past and that the fighting forces of the future will be no more than police forces—collaborating with one another to suppress criminals or quell local disturbances rather than pitting themselves against each other—until that semi-millennial state of the world has definitely come about. They must be guided by the wise dictum of Admiral Mahan that " it is possible to be too quick in discarding as well as to be too slow in adopting " ; and while they must envisage the eventual possibility that fighting forces will be converted, somehow or other, into police forces, for the present they must continue on the lines to which they were accustomed. All navies which survive must now undertake the task of reduction from the swollen dimensions which they have inevitably assumed in a world war to a much smaller peace establishment appropriate to the needs of the day. The difficulty is to determine what those needs will really be.

An important part of that determination must, of course, be a close examination of the real course of events during the late war in the light of information now available from both sides—the process, in fact, of ascertaining and applying what are known to staff colleges as " the lessons of the war." The full data in this sphere, though presumably in the possession of the Allied Governments, have not yet been made public though some portions of them have been allowed to leak out, as it were, from time to time, chiefly on the other side of the Atlantic. It is not possible for anyone not in an official position yet to do more than to draw attention on very general lines to some of the broader and more obvious lessons that emerge from what is known of the actual course of events ; and to do so, in respect of some aspects of the naval war, is the purpose of this chapter. All that the lay public can do is to insist that the process of what is known as " operational research " shall be applied to the whole conduct of the war, in every sphere and not in water-tight compartments, by the experts of the fighting services in whose hands the relevant records are. It cannot undertake that task for them, though it is entitled to insist that the experts shall prove their case, shall present a reasoned statement of their conclusions, so far as they affect the composition of the fighting forces in the future, rather than a mere *obiter dictum* such as has only too often in the past been made the basis of the provision for national defence.

The first, and perhaps the most outstanding lesson of the war, as the present writer argued in last year's issue of " Brassey," is the old lesson, that " victory is won not by this arm or that, but by the full collaboration of all arms ; by their employment, not independently, each in its own sphere or in its own element, but inter-dependently, all directed alike towards one end." To the student of sea war in particular, the most outstanding example of this great truth was furnished by the course of the Battle of the Atlantic which, it must never be forgotten, was only won by the narrowest of margins. " At the peak in 1941 and 1942," Mr. Churchill and the President of the United States wrote in their final Joint Statement, " the issue of the struggle hung in the balance." The balance was not tipped on the side of success until even a year later, in the summer of 1943, when at long last a sufficient proportion of the air weapons that were available were diverted from other less effective employments to the vital task of securing command of the sea. It was clearly shown by the course of the war at sea, almost from the start of the war, that the U-boat attack on merchant shipping could be mastered by devoting all effective forces in collaboration to that end. Ships could not achieve it alone ; aircraft could not achieve it alone, though both these arms in their own sphere could play their part ; but ships and aircraft, in numbers adequate to the magnitude of the task, by collaboration could achieve the mastery. In this long drawn-out struggle, there was an intermediate stage during which sufficient air forces were devoted to the battle to give, in collaboration with the warships allocated to that duty, fairly adequate control over the U-boats within the range that could be covered from the air bases on both sides of the Atlantic. But even when that stage had been reached, there was still a gap in mid-Atlantic which could not be covered by aircraft working either from the United Kingdom and its outposts or from America ; in this gap the maintenance of command of the sea was entrusted to warships, all too inadequate in numbers, in the absence of collaboration from the air, to have even a hope of achieving it against the enemy with which they were faced. It was in this gap that the enemy concentrated his attacks, and continued to achieve a volume of destruction which seriously threatened the Allies' capacity to hold their own in the war in general. Once the gap was bridged, partly by the employment of " V.L.R. aircraft " working from the shore, but more effectively by ship-borne aircraft working from escort carriers and " M.A.C." ships, the balance was at last brought down on the right side.

It is, of course, true that during this critical period the Allies suffered from a serious over-all shortage of the weapons of war, both ships and aircraft. The Battle of Britain, as everyone knows, was won by the few against the many, and it was doubtless not until the disparity of material strength could be definitely reduced that there could be any confident hope of turning the corner. But, making every allowance for that factor, it must still be admitted that there was at that time a certain failure to apply adequately the principle of the interdependence of different arms. During all the period of 1941 and 1942—and indeed during the first part of 1943—when losses at sea were mounting and standing at a constantly dangerous level for lack of support in the air for the hard-pressed ships on which the burden of defending the convoys was laid, large industrial resources were being devoted to the provision of air forces designed only for direct attack on industrial Germany ; and a great portion of the existing air forces were being employed on that task alone. This was being done on the theory, completely unproved at the time, and shown by subsequent experience to be entirely mistaken, that this indirect attack provided a way to win the war on its own, and to disprove the conclusion from all history of war that concentration of all arms on the one end can alone lead to victory.

The indirect attack was designed on the theory that the bombing of shipyards and industrial plants would cut off the supply of U-boats at the source and would prevent them ever reaching the high seas to operate against our shipping ; and on the theory that direct attack on the German people would destroy their " will to war " and cause them to put pressure on Hitler to bring the war to an end, to abandon his dreams of world domination, that is to say, and submit to the uncompromising terms which were all that the United Nations were prepared to concede. It cannot be too clearly pointed out that not only were these theories completely unproved at the time—as many students of strategy had argued, year in and year out, ever since they were first propounded during the 1914–18 war—but that they were completely disproved by actual events of 1939–45. The curve of production of U-boats mounted steadily throughout the years of the war, and it was not until near the end of it, when the bombing by the Allies had mounted to a volume unthought of in the dangerous years of 1940–43, that its steady rise was even checked. No doubt the material interruption of the process of building U-boats, and the necessity for taking steps—by dispersal of industry, prefabrication, and such processes—to minimise that interruption, reduced the rate of increase below the absolute maximum that might have been achieved in Germany if industry had been uninterrupted by any of the " friction of war." But throughout the danger period the increase was real and solid. Even at the end of the war the production of new U-boats was still in full swing. When the port of Bremen was occupied by Allied forces at the end of April, 1945, in the Deschimag building yard sixteen U-boats of the largest size were found to be on the point of completion, almost ready for launching. Every building slip in the yard was occupied except one from which a ship had been launched only a day or two before.

This remarkable achievement on the part of the enemy was the result of his great extension of the principle of dispersal, as the answer to bomb attack on industry. U-boats were prefabricated in standardised portions, built in factories all over Germany, and only brought together at the building slip when ready for assembly. The actual process of assembly had been accelerated until it took no more than some five days from the arrival of the parts to the launching of the completed boat. There must have been hundreds of occasions on which no Allied air attack was possible on one or other particular building yard for a space of more than five days; and when that happened the building of the particular U-boats that happened to be there was quite unaffected by the air attack, however heavy it might be on Berlin or the marshalling yards of Hamm. It is probable that many of the U-boats that came off the building slips of Bremen and other German ports in the last few weeks of the war never actually passed into service. But the reason for that was not the bombing of yards or factories, but the fact that the U-boat training school at Swinemunde had been occupied by the advancing Russian armies—the scheme to transfer that establishment to Oslo Fjord never came into effect, being overtaken by the general German collapse that followed from the defeat of the German army in the field.

The other theory, that direct attack on the " will to war " of the Germany people would induce them to put pressure on their rulers to abandon their whole policy so deliberately embarked on, proved equally illusory. The one invariable lesson from all the wars of history has been that victory has been gained by the defeat of the enemy's armed forces, and that there is no short cut to victory that obviates the necessity for that fundamental achievement. This proved to be as true as ever in the war against Germany and Japan. In Germany, there was no sign of any slackening of the " will to war " until not only had the German army been defeated in the field—to which the defeat of the German Navy at sea and of the Luftwaffe in the air were essential preliminaries—but also until the whole of Germany, including the capital, had been occupied by the victorious Allies. In Japan it has been sometimes represented that it was the atomic bombs on Hiroshima and Nagasaki that brought about the surrender of Japan; but, on examination, that proposition can hardly be maintained. Japan had begun to put out peace feelers before the first atomic bomb was actually dropped—indeed those tentative approaches actually preceded the Russian declaration of war against her. Her navy had been destroyed, and she had only 49 left out of the 369 warships with which she started the war. No great reduction had even been effected in her total military and air strength; but the complete command of the sea achieved by the Allies had immobilised and emasculated those other arms. The atomic bomb provided a valid excuse for the Japanese rulers to accept the defeat which had already been inflicted on her, an acceptance from which they had been deterred up to then very largely by Oriental reluctance to admit loss of face. But it did not itself bring victory, nor could it of itself have obviated the need for the employment of all arms and their collaboration to one end, which in fact had already brought that victory.

An equally striking example is to be found in the course of the war in the Mediterranean, on the small scale no less than on the great. The military campaign in Greece of 1941, and the naval operations in connection with the withdrawal from Greece and from Crete when the former had come to a disastrous end, both provided evidence of the same great principle. In the former, the British air forces sent to Greece were all too weak from the first for the heavy burdens thrown on them, and were completely outnumbered when the Luftwaffe appeared in the country in force. Yet even in the first phase, though they achieved little or nothing while employed independently—on strategic action as it was called—of the Army's operations, when tactical collaboration with the Army was forced on them by the course of events, a substantial measure of success was quickly achieved. It could not be maintained, of course, in the face of the vastly superior enemy forces soon brought to bear; but the lesson was plain for all to read. Even plainer was the lesson at sea. Admiral Cunningham's Fleet was indeed materially outclassed by that of Italy; but it ranged the Mediterranean at will, and it was Mussolini's fleet that kept the shelter of its harbour and fled back there at any threat of being engaged on the open waters of *Mare Nostrum*. Though practically devoid of any tactical support in the air beyond what could be given by his own small detachment of naval aircraft in his one aircraft carrier, Admiral Cunningham could nevertheless hold his own against the full strength of the *Regia Aeronautica*. Even the air forces that were available based in Egypt and the Levant were neither designed for nor trained in collaboration in sea operations. The inevitable result was that once substantial forces of the Luftwaffe became available, the Eastern Mediterranean became untenable by British ships. The Luftwaffe could not of itself achieve command of the Eastern Mediterranean, beyond the comparatively closed waters of the Ægean; but it could deny that command to the unbalanced forces which were all that were left at the disposal of Sir Andrew Cunningham at the time.

The later campaign in the Mediterranean proved the truth of the principle even more positively. Lack of unity and collaboration had been shown to lead inevitably to defeat. It remained for the operations of 1942 to demonstrate that victory followed from those principles being put fully into effect. In the latter campaign, all three arms pursued the same aim. The Navy, with its own air contingent, carried the Army and the Air Force to North Africa, not only round the Cape to Egypt, but also direct to the Algerian and Morocco landing places. The Army secured the ground hitherto held by the enemy—the only arm, be it noted, capable of doing that—whence the Navy and Air Force were provided with the bases indispensable for their further action. Working from those bases, air forces could be provided adequate not only for securing, in collaboration with the Navy, command of the sea throughout the Mediterranean, but also for the continued progress of the Army on land. Not one of the three arms could have achieved those same results alone. Every operation by any one of the three arms which was not directly related to the common aim was in reality a waste of effort.

It is of course a difficult task—impossible, perhaps, for the layman or outsider—to draw the line between those operations which are directly related to the common purpose and those which, though ultimately contributing to the desired end, are so remote from the work in hand as to be in effect a waste of effort. For instance, the attack on German shipyards at the expense of providing the forces needed for destroying U-boats operating at sea, was clearly shown to be a waste of effort. So was the attack on the marshalling yards of Hamm at a time when tankers bringing fuel to the country were being sunk by U-boats at such a rate as to threaten the power of bombers to get into the air at all. But the attack by air on German communications throughout the Continent in June and July, 1944, by hampering the movement of German forces, was a highly valuable contribution to victory in enabling the Allied forces in Normandy to be built up more rapidly than German forces could be concentrated to oppose their advance. Only by a close and impartial examination of the actual results of all the operations of war—the materials for which are available only to Governments, but are now available to them in full—can a right judgment be reached on these difficult problems. Yet on that judgment must depend the proportions of the various arms that go to form the national forces of the future. We cannot, as already pointed out, afford to dispense with national Defence Forces of the pattern we have known up to now; but equally we cannot afford to waste our resources in the provision of any but the best balanced and most efficient of such forces.

To come down to matters of greater detail, decisions must be reached sooner or later regarding the types of warships appropriate to the conditions of the future. So far as the present is concerned, the Royal Navy—and the same is true of the United States Navy—possesses far more warships than it has need to employ in any conditions that can be foreseen for some time to come; and the problems of administration are for the time being far more concerned with reduction to a peace establishment than with any aspect of future construction. Whatever the tasks and duties thrown on the Royal Navy for the next few years at least, they will have to be discharged by the ships that the Navy already possesses, even if they differ very substantially from the warships which would be built today in the light of present-day knowledge and the development of weapons and methods in the last few years. But we cannot afford to rely for the next two decades on the warships we now possess, as we did after the 1914–18 war; for to do so is to kill the shipbuilding resources upon which, as long as sea power is the necessity to us that it has been for the last four centuries, the Navy must depend for its capacity once more to expand when need arises. A shipbuilding industry—whether under private enterprise or, as some think it should be, nationalised—cannot survive *in vacuo*, without work to keep it together. The skilled men upon whom it is entirely dependent will drift away to the other industries once it is allowed to dwindle or become stagnant, and there will be no others entering it and being trained to provide the next generation of shipwrights. It needs a steady flow of orders to keep it in existence, a flow that need not be of great volume so long as it is sufficient to ensure the survival of the shipbuilding industry. Sooner or later, therefore, a start will have to be made with replacing existing warships by new construction, in spite of the large surplus of warships of almost every class possessed by the Navy today.

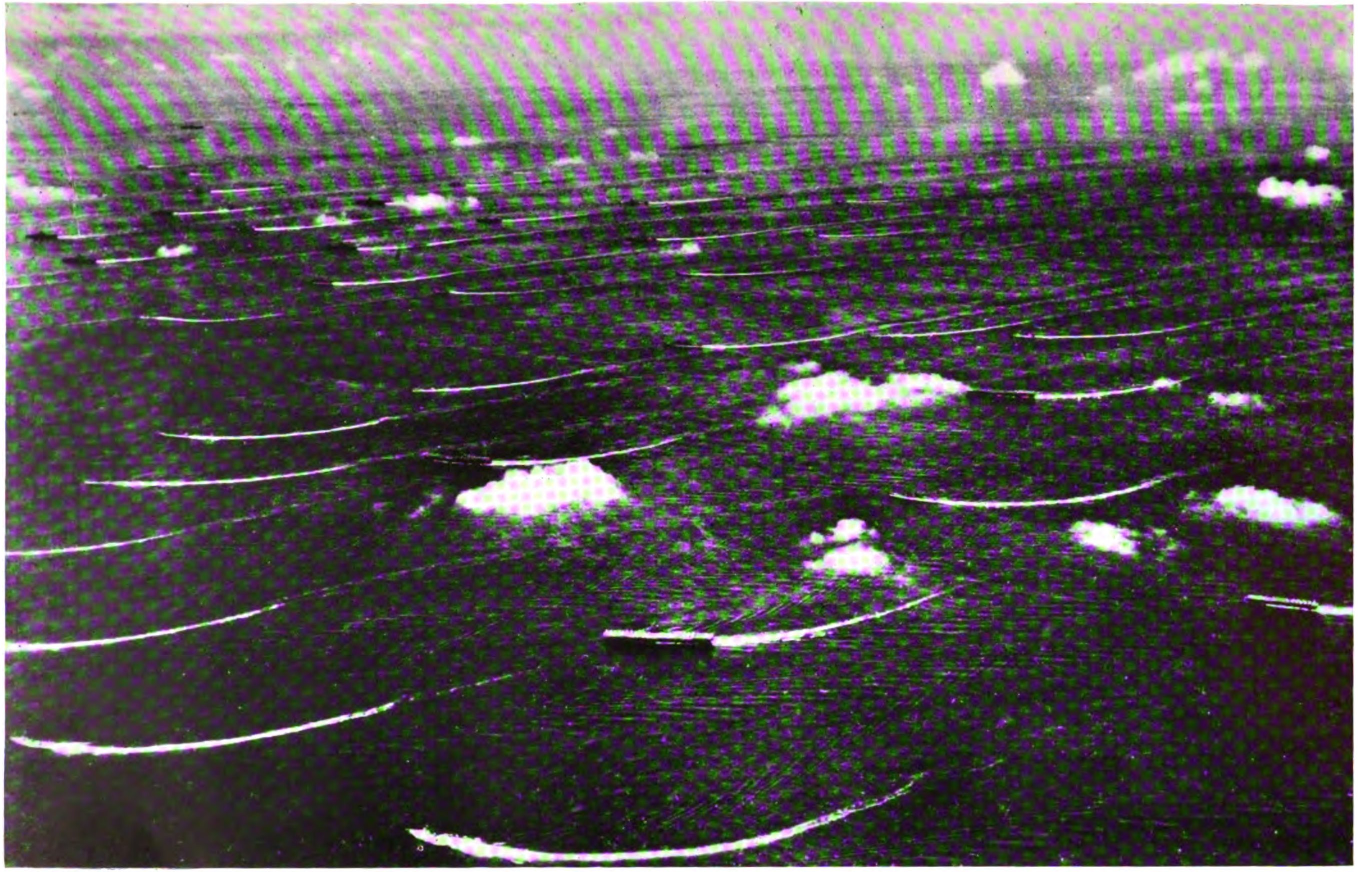
If the money and resources devoted to this task of replacement are not to be entirely wasted, it is necessary to determine what the needs of the day really are. That determination calls for exhaustive and scientific analysis of the experience of the war and of the scientific and technical developments which have been achieved since the war came to an end. It will not do for the authorities to allow themselves to be swayed by noisy generalisations based on superficial examination of the relevant factors, such as were heard so vociferously in 1919. It will be remembered that an admiral with a very distinguished record as a pioneer of naval development in his time—Admiral Sir Percy Scott—bombarded the public in that year, in letters to *The Times* and by other methods, with the oft-repeated question "what is the use of a battleship?"; and proceeded to answer it in the alleged words of a midshipman of his acquaintance that it was, "no damned use at all." That was his way of urging the Admiralty of the day to scrap all their battleships and to rely on aircraft and submarines to perform the function for which they had hitherto been provided. Neither the British Admiralty nor any other, luckily for themselves, paid any heed to this campaign; and their wisdom in so doing was vindicated by the course of the early part of the war which has just ended. The battleships which existed in 1939 proved their worth time and again. When the Japanese elected to make their bid for the domination of the eastern hemisphere, it was at the American battlefleet, as the one force they had most to fear as an obstacle to their plans, that they struck their first blow in the attack at Pearl Harbour on December 7, 1941; Dr. Rosinski elaborates this point in Chapter VI. When the American Navy Department was faced with the necessity of building up again a navy powerful enough to restore the situation, it was largely upon battleships of the most advanced design that they concentrated—the simultaneous development of aircraft carriers is dealt with below—and those battleships proved their value to the full right up to the moment of victory. It is quite clear that there could be no substitute for them up to that time.

To say that, however, is not to maintain that the battleship in the form we have known it up to now will necessarily be reproduced in the future. In the later stages of the war of the Pacific, in fact, the battleships were never used in the manner that was envisaged at the time they were designed—with the single exception, perhaps, of the night action in the Surigao Strait in the Philippines on October 23, 1944. That was the only occasion, if we exclude the smaller and more confused earlier night actions in the Solomon Islands, on which battleships came into action against each other; all the other battles in the Pacific were fought with distances up to 200 miles separating the rival ships, blows being struck by ship-borne aircraft on either side. The battleships of the American Fleet in the last stages of the Pacific War performed the functions of anti-aircraft ships, being enabled to do so with great effect by their possession of a heavy and highly effective anti-aircraft armament—only large ships at that time were capable of accommodating the intricate and comparatively bulky installation of A.A. fire-control apparatus—and by the very effective measure of protection which it is possible to embody in a capital ship. So far as the published accounts of the various actions in the later stages of the Pacific war reveal the facts, it would seem that the *kamikaze* suicide bombers on which the Japanese placed such great hopes, were effective chiefly against destroyers, aircraft carriers—when they succeeded in penetrating the very efficient defence provided for those essential factors of the Fleet—and other lightly protected ships. Some cases are mentioned of battleships being damaged by them, but none, in the records available to the writer, of battleships being put out of action by them.

In this rôle of anti-aircraft ships, however, battleships made no use of what may well be considered their chief feature, their armament of heavy guns. In the design of a battleship it is the size of the principal guns that the ship is to carry that determine the principal characteristics of the ship ; that is, in fact, the governing factor in settling what all her characteristics are to be. The battleships of the British and American Pacific Fleets did indeed, in the later stages of the Japanese war, use their main armaments for bombarding various military targets on the mainland of Japan that could be reached by ships' gunfire from the sea. But that employment of their main armament was merely incidental to the stage that had been reached in the process of amphibious attack on the heart of Japan itself, part of the preparation for the final assault. The battleships' heavy guns were used for that purpose because they were available ; if amphibious operations had been the chief function for which the Navies had been designed from the first, it by no means follows that the battleships of today would have been built. They might have evolved in something of the same form of course, but equally they might have evolved into some quite different form ; and the same is true of the anti-aircraft ship.

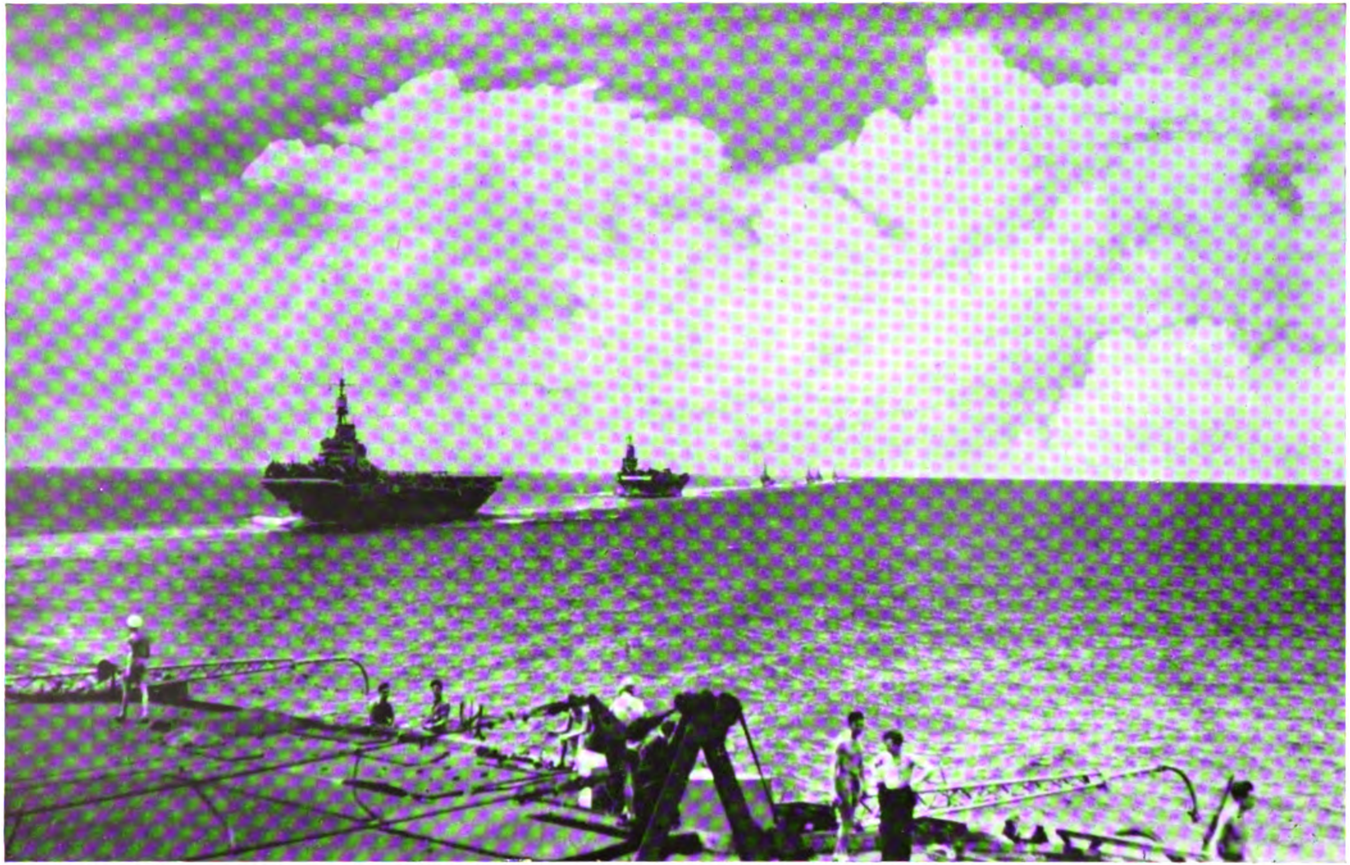
If, therefore, one is approaching the problem of whether the battleship in the form in which we know it today is likely to be further multiplied in the navies of the immediate future, the question arises whether the conditions of today call for the provision of battleships in order to constitute, as they have in the past, the only effective antidote to the employment of battleships by a possible future enemy. On that subject it must be realised that nearly all the battleships of the Japanese fleet were destroyed not by Allied battleships, but by attack from the air ; yet, even so, it would be rash for the layman, without access to the full records of what actually occurred in the Pacific war, to conclude that the circumstances of that war are of universal application. In the conditions of the Pacific, air forces proved fully competent to master Japanese sea forces. On the other hand, Japanese air forces entirely failed in the later stages of the war to attack the Allied sea forces with effect, though they had certainly achieved the upper hand at the outset of the war, in one theatre at least, when the Prince of Wales and Repulse were destroyed by air forces alone. But to quote that incident at once emphasises the danger of generalising from insufficient data, for the case of the Prince of Wales does not in any way prove that battleships can always be eliminated by air forces. It merely proves that if they expose themselves, without air support, to attack by air forces of overwhelming strength, they undoubtedly will be sunk—a fact which everyone knew already. Before the United States forces could turn the tables and destroy the navy of Japan, they had in their turn to assemble overwhelming force in the air, and to bring it into action at the decisive point ; and that point then lay in enemy waters.

Yet even at an earlier stage, when the American air forces had by no means reached the standard of being in overwhelming strength, they had



The Allied Pacific Fleet manœuvring off Japanese Coast before Japanese surrender.

(British official photograph. Crown copyright reserved.)



Carrier Squadron of British Pacific Fleet. H.M. Ships Implacable and Victorious seen from H.M.S. Formidable.

(British official photograph. Crown copyright reserved.)

gained the victory over Japanese naval forces in the battles of the Coral Sea and of Midway—the two battles which were the turning point of the whole Pacific war. It certainly looks, to a superficial examination, as if the ship-versus-ship action, for which the battleships were evolved, might be things of the past. And if that be so, so that the battleship is now needed chiefly as an anti-aircraft ship, its development in the immediate future may be expected to take a different line. Yet again this momentous decision cannot be taken on a superficial examination of only part—that part which happens to be available so far to the public—of the experiences of the war, or without full examination of the whole. It must be determined how far the local conditions of the Pacific affected the issue, and how far they are reproduced elsewhere.

The episode of the Bismarck's sortie into the Atlantic in 1941 is a case in point. Elaborate arrangements had been made by the Germans to enable her to remain at sea for a long period, and to operate without a base, in the way that the United States Fleet—and later the British Pacific Fleet—afterwards actually did in the Pacific. If those arrangements had actually worked, she might have done so much damage to British sea communications in the Atlantic as virtually to bring them to a standstill; and in that case the outcome of the war would have been very different. If that German project had materialised, the question arises as to whether her operations could have been mastered and prevented by air forces alone. In the event, air action played an exceedingly important part in the eventual results, but it was a part only. One aircraft from the Victorious hit her with a torpedo off the tip of Greenland, and the damage thus inflicted, together with that sustained from the gunfire of the Hood and Prince of Wales, though not crippling, decided her to make for Brest forthwith, presumably with the object of getting the damage repaired, instead of ranging the Atlantic in accordance with her original plan. That she was doing so was unknown to the British authorities at the time; but steps were at once taken to organise air reconnaissance that should locate her if she were making for a German-occupied French port. Actually she was located by a land-based flying-boat from the United Kingdom; but if that look-out line had failed, she would shortly afterwards have been sighted by reconnaissance aircraft from H.M.S. Ark Royal, which were already covering every possible approach route to the French coast. The Ark Royal's aircraft at once took over the duty of shadowing the German battleship and attacked her with torpedoes as soon as possible. The first attack failed, but the second was successful. It did not indeed sink the Bismarck, for it is doubtful if the torpedoes then carried by ship-borne aircraft were capable of achieving that decisive result. But it did disable her propellers and thus enable Admiral Tovey's battleships to overtake her and complete her destruction.

That is what actually happened in 1941. If one is to determine whether the Allies could safely have relied on air forces alone to meet the menace of the Bismarck, as the Japanese did in order to meet the menace of the Prince of Wales, one must be able to reach a right answer to two questions. Would the Bismarck, if she had been in the situation of the Prince of Wales, have been destroyed by the weight of Japanese air attack brought to bear in the Gulf of Siam, or would she have survived it; and was it possible for the British forces to bring to bear in the Atlantic the same weight of air attack that the Japanese assembled off the coast of Malaya? The first question can only be answered with full knowledge of the material characteristics and constructional details of the two ships, knowledge which is in the hands of the Admiralty, but not of the public. But the second question is more easily answered; it was not possible, in as much as the necessary bases were not available. The Bismarck could undoubtedly have been destroyed by air attack from a fleet of aircraft carriers similar to that commanded by Admiral Spruance—whose aircraft destroyed her contemporary Japanese ship, the Yamato, on April 7, 1945—just as effectively as she actually was destroyed by the gunfire and torpedoes of the Home Fleet; but to produce, anywhere in the North Atlantic, a concentration of air forces of the same order of size from air bases situated in the congested area of the United Kingdom at one corner of that ocean, if possible at all would demand the provision of such immense numbers of aircraft as to be an uneconomical use of available resources. The conclusion must be that nothing which happened in the recent war has yet justified the abandonment of sea forces; but that it is not yet possible to pronounce with confidence what precise form the successors to present battleships will assume.

It is too often asserted, chiefly by those who have little or no technical knowledge and have made little or no study of the history or art of war, that the coming of the atomic bomb is going to render all existing weapons obsolete and to govern the design of construction of all weapons of the future. Yet in truth, as Major Oliver Stewart demonstrates very convincingly in a later chapter, there is little or no justification for either of those pronouncements. The atomic bomb is in fact nothing but " a bigger and a better bomb," and as such it may possibly prove to be capable of sinking any ship that may be within range of its destructive effect when it explodes. Even that, before the trials at Bikini—which have not yet taken place as these words are being written—is mere speculation; and even if it does prove to be so, it will not be the first time that Admiralties and their naval architects have been confronted with that situation. In 1914, the battleship H.M.S. Audacious was destroyed by the explosion of one mine—not a very big mine at that, by the standards of today. The armoured cruisers H.M.S. Hogue, Aboukir, and Cressy were each destroyed by the explosion of one torpedo; and indeed it had been known already that ships of war were capable of being sunk by the weapons of the day. But this did not lead immediately to the disappearance of ships-of-war, battleships or large cruisers; it merely led to their being given greater powers of resistance to the effect of the weapons of the day, and to the more general recognition of the very general principle of war, that the best means of defence is offence. The most effective method of protecting oneself from damage by the weapons of an enemy is to destroy the enemy before he is able to deliver his blow, and that principle is just as sound if the weapon the enemy carries is an atomic bomb as it was when he was armed merely with the guns or torpedoes of 1914 or the even cruder weapons of earlier days.

There is therefore no reason to accept the prophesy that the atomic bomb is likely to have any great influence on the design of battleships, whether the battleship develops chiefly as an A.A. ship or chiefly as a ship designed to fight its like. On the other hand, another recent development of modern weapons, which has attracted far less public attention than the atomic bomb, is likely to have a very profound influence on their design. That development is the evolution of the rocket as a weapon of precision. As was mentioned above, the whole design of the battleship of recent years has been governed by the size of the gun she is designed to mount as her principal armament. It is not only that the gun itself becomes heavier as its size increases—as does its ammunition—and that the ship must be capable of carrying that weight. There is also the recoil to be provided for; both the gun-mounting itself and the structure of the ship that carries it must be strong and rigid enough to withstand and absorb the immense energy developed by the discharge of a great gun. It is this latter factor, far more than the weight of the guns and their ammunition themselves, that has been responsible for the great increase in the size of the battleships of today as compared with those of a generation ago.

The rocket projectile, on the other hand, produces no recoil and can therefore be launched from any vessel, however flimsy, that possesses enough buoyancy to carry it. Its launching guide does not have to withstand the force of an explosion that projects it, since the rocket itself carries its propelling agency. There is therefore no need for an immensely strong and heavy tube, comparable to the heavy gun, to ensure the rocket being guided with accuracy at the beginning of its flight; its launching guide may be a light tube, or even an open frame, needing no bulky and rigid structure to carry it. The position up to recent years has been that only great ships, battleships, large cruisers, and monitors, were capable of dealing the heavy blows needed to master the defences of an enemy capital ship or fortified coast. But that is now all changed, and in the Allied amphibious operations in Sicily and Normandy, lightly-built landing craft, carrying rocket-launching apparatus and nothing else, were able to produce against the fortified beaches just before the actual disembarkation, a volume of fire which in earlier days it would have needed a great battle fleet to deliver.

Thus, whether the chief rôle of the battleship of the future proves to be that of fighting ship-to-ship battles as in 1914–18, or that of anti-aircraft ship as were the Allied battleships in the Pacific in 1945, it looks as if the development of rockets were likely profoundly to affect their design. They may possibly look more like large submarines temporarily on the surface than like the men-of-war to which we have become accustomed in the last generation, though there are so many factors unknown to the public that will influence their evolution that the writer, at least, is not prepared to hazard more than a vague and tentative guess. What would seem to be quite clear, however, is that, as far as oceanic warfare is concerned at least, the battleship has been deposed from her pride of place as the "capital ship," the one indispensable element in a powerful fleet as an instrument of sea power, by the aircraft carrier.

Sea power is that which gives command of the sea, and command of the sea means the power to use the sea as a highway and means of communication and to deny that use to an enemy. The rôle of all war fleets is to keep the humble merchant ships moving—in which category we may include the troop-carriers and landing craft—to protect them during passage and to assist them in the accomplishment of their ultimate tasks, whether those be to put an army into a defended enemy territory or to support and supply them when there. The only method by which they can do that is to destroy any enemy that attempt to interfere with sea traffic, amongst the most formidable of which today are air forces; and though ships can protect themselves to a certain degree against air attack by their own A.A. armament, full protection can only be given by achieving superiority in the air itself. If the air forces necessary to provide that superiority cannot be brought into action in the decisive area from land bases, moving to the scene of action under their own power, the fleet itself must carry them. It can do little or nothing without them, as the British experiences in the Mediterranean in 1941 and the Ægean in 1943 proved to the full; and in the absence of an adequate air arm, not even battleships will save a fleet from defeat, if not utter destruction, as the Japanese found to their cost time after time in the later stages of the Pacific war.

Though it is thus clearly now the " core of the fleet "—in the American phrase—the aircraft carrier is by no means completely self-sufficient as was, for instance, the ship of the line in pre-torpedo days. It needs the collaboration of destroyers to assist in its own protection against enemy submarine attack, though its own aircraft are a powerful element in that defence. It needs the collaboration of anti-aircraft ships to assist in its protection against such enemy aircraft attack as may get past the counter-attack of its own fighters which are its chief defence in the air—whether those A.A. ships be battleships, cruisers, or ships specially fitted for the A.A. rôle. It is, in short, but one element in a whole balanced force, the most indispensable perhaps, but still only capable of exerting its full strength in collaboration with all the others. From whatever aspect the course of the war is studied, this same lesson thus emerges.

H. G. T.

CHAPTER II.

A NAVAL CHRONICLE.

JANUARY.

The situation in Europe at the opening of 1945 gave promise of the early defeat of Germany, yet it could scarcely be foreseen then that this would be followed so soon by the downfall of Japan and that the year would mark the double victory of the Allies. But, on both sides of the world, it was being shown once again that success in major wars goes hand in hand with sea-power. It was command of the narrow waters of the Channel approaches which had enabled the Allies to return to the Continent and there build up the armies which were to beat out the last embers of German resistance. In the Far East, the sea battles for the Philippines had not only reduced the Japanese fleet to impotence, but, as events were to prove, had paved the way for such intolerable assaults from the air on their homeland that the Japanese could endure no more.

Just how great had been the part played by the Allied navies from "D-day" to the end of the previous year was demonstrated by an announcement by SHAEF early in the new year. Amongst the details this gave were that over 125,000 naval officers and men and nearly 70,000 of the Merchant Marine were engaged on "D-day." Over 5,000 ships, swept in by 200 minesweepers, were employed in the actual assault. Over 2,000 merchant vessels with a gross displacement of over 4,000,000 tons had been used in the "build up" for the invasion of Europe. The landings had been made under cover of 800 naval guns of from 4-inch to 16-inch calibre. Up to December 31, Allied warships fired over 140,000 rounds in support of the armies, and another 8,000 rounds against special targets, such as Brest, Cherbourg, Cézembre, and some thirty 3-inch to 9-inch batteries at Westkapelle.

During the first twenty-eight days, 1,000,000 men were ferried safely across the Channel and landed, together with over 180,000 vehicles, over 1,500,000 tons of stores (apart from another 1,500,000 tons of gear for the prefabricated harbours); and within a hundred days over 2,200,000 men, 450,000 vehicles, and nearly 4,000,000 tons of stores.

The enemy's main counter-offensive was by mines, and over 1,700 were swept after "D-day," including over 1,000 in the first hundred days. An outstanding feat was the clearing of the 73-mile Scheldt channel by nearly 200 minesweepers, which reopened Antwerp on November 28.

The great anchorage off the Normandy Coast covered an area of about 200 square miles and its eastern end was only 20 miles from the German E-boat base at Le Havre; nevertheless, enemy surface craft were contained in the mouth of the Seine, and were brought to action, frequently under the fire of the enemy shore batteries, on twenty-eight occasions by Allied inshore patrols of frigates, trawlers, and M.T.B.s. In all, 68 enemy ships, varying from destroyers to merchantmen, were sunk, over a hundred "human torpedoes" and explosive motor-boats accounted for in determined night attacks on Allied anchorages. Another 232 enemy vessels were scuttled, mined, damaged by surface or air forces, or immobilised in the few ports in the Bay of Biscay still held by the enemy. Despite enemy counter measures, only 1·6 per cent. of the vehicles and stores landed on the beaches were lost.

Among ports opened for the supply of the invasion armies were Antwerp, Cherbourg, Le Havre, Rouen, Boulogne, Calais, Ostend, Dieppe, and Etaples. Naval port parties, said the SHAEF announcement, performed outstanding work in clearing enemy demolitions and bringing them back into use.

The success of the Allied armies on the Continent was not, however, dependent solely on the activities of the Navy in the waters of the Channel and of the Belgian and Dutch Coasts ; it must be attributed no less to the unceasing warfare against the intensified efforts of the U-boats to interrupt the vital trans-Atlantic supply lines. The Anglo-American statement for January referred to the greater activity of the enemy's submarines and to " new devices," against which " the results of our counter-measures have been promising." Some particulars of one of these devices, known as the *Schnorkel,* were given by the Naval Correspondent in *The Times* (February 9, 1945). This was described as being, in effect, a breathing pipe, which enabled the U-boat to remain under water for long periods. Hitherto the chief weaknesses of the German submarines had been the necessity for them to surface for an hour or two every 24 hours to recharge their batteries, and their strictly limited speed and endurance when submerged. The *Schnorkel* enabled the Diesel engines to be kept running without the boat surfacing ; this extended almost indefinitely its submerged endurance, either by using the Diesel engines to propel it while submerged, or by using the electric motors for recharging the batteries with the Diesel engines as necessary. The *Schnorkel* was very inconspicuous from a ship or from the air, and this enabled U-boats to penetrate into areas hitherto denied them ; but it did not provide them with any additional immunity from detection by the Asdic.

On January 12, it was announced in Australia that a naval manning depot for the Royal Navy (as distinct from the R.A.N.) had been established at Sydney for the service of the British Pacific Fleet, and that it had been named H.M.S. " Golden Hind " after the famous ship in which Sir Francis Drake had circumnavigated the world.

It was officially reported from Madrid, on January 16, that the Italian cruiser " Attilio Regolo " and four destroyers, which had been interned in the Balearic Islands, had been released by the Spanish Government and had sailed for an Allied port.

French ports being opened again, there naturally followed a demand for shipping to bring in much needed supplies for the civil population. As a move towards making France self-supporting in this direction, the British and U.S. Governments, on January 17, allocated a number of ships to the French Provisional Government for the first three months of 1945 ; it was intimated that endeavour would be made to extend this arrangement during the subsequent months. Later in the month the French Minister of Transport announced that fifty Liberty ships, aggregating 500,000 tons, had been released for French use and would be manned by French crews.

Another fine record of achievements by a British submarine was published on the return of H.M.S. Tally Ho (Commander L. W. A. Bennington, D.S.O., D.S.C.) to her Home port after eighteen months in the Far East. During patrols extending over 61,000 miles, she had sunk a 5,000-ton

Japanese cruiser of the " Kuma " class, a 1,000-ton escort vessel, an enemy submarine, a submarine chaser, and seventeen other ships ranging from ammunition laden coastal craft to supply vessels up to 6,000 tons. Some of these successes had been achieved in the Malacca Strait.

On January 2, it was made known that Admiral Sir Geoffrey Layton had been succeeded by Lieut.-General H. E. de R. Wetherall as Commander-in-Chief, Ceylon. On January 18, SHAEF announced the appointment of Vice-Admiral (Acting Admiral) Sir Harold Burrough as Allied Naval C.-in-C., Allied Expeditionary Force, in succession to the late Admiral Sir Bertram Ramsay.

Anxiety about their communications with Norway was doubtless the cause of a notification by the German Government to Sweden that the blockade zone across the Skagerrak had been extended 10 miles to the eastward and that any Swedish ship entering the zone without permission risked destruction at sight. There would seem to have been a connection between this attempt to frighten off neutral shipping and the attack by submarines of " unknown nationality," on January 31, on a Swedish minesweeper, and on the following day on a Swedish convoy in Baltic waters. Successful evasive action was taken in both cases, and it was announced from Stockholm that in future a naval escort of destroyers and aircraft would be provided for all Swedish shipping plying between the North end of Kalmar Sound and the southern part of the Stockholm archipelago.

The potentialities of new German weapons were alluded to by Admiral Jonas Ingram, C.-in-C. of the U.S. Atlantic Fleet in a statement made in New York early in the month. In this he said that " robot " raids against that city were " probable within the next thirty to sixty days " ; he believed that such attacks would be made by V-bombs launched from U-boats.

In an official report published in Washington and which became available early in 1945, it was stated that since Pearl Harbour the U.S. Navy had lost 230 warships, including 2 battleships, 9 aircraft carriers, 9 cruisers, 51 destroyers, 33 submarines, and miscellaneous craft ; but that those losses had since been replaced many times over and that the fleet was now " probably larger than the combined navies of the world." The U.S.A. had also lost about 3,750,000 gross tons of merchant shipping, but had built, in the same time, about 42,000,000 tons.

Admiral Nimitz stated in Hawaii that Japan had lost every one of the large aircraft carriers she possessed at the outbreak of war, i.e. the Akagi, Kaga, Hiryu, and Soryu at Midway in June 1942, and the Syokaku and Zuikaku in the Philippines battles of 1944.

HOME WATERS.

As the Allied armies advanced, so the feeble efforts of what remained of the German navy, withdrawn to more northerly waters, were largely confined to attempts to keep open coastal communications with forces in Norway. The Allied operations were directed to interfere as much as possible with this shipping. On January 9 it was reported that light coastal forces of the Norwegian Navy, operating off the Coast of Norway at night, had engaged an enemy convoy proceeding under escort in a southerly direction. Without sustaining damage or casualties, they sank a large supply ship, torpedoed a second one leaving her down by the bows, and scored repeated hits by gunfire on a M-class minesweeper.

A more extensive operation was that carried out by a British naval force under Rear-Admiral R. R. McGrigor, flying his flag in H.M.S. Norfolk. He had with him another cruiser—H.M.S. Bellona, the escort carriers Premier and Trumpeter and the destroyers Onslow, Orwell, and Onslaught. In a short but brisk action off the Norwegian Coast in the early hours of January 11–12, a German convoy carrying vital war supplies was virtually destroyed; a tanker and a minesweeper were sunk and the remaining six or seven ships severely damaged, set on fire and left blazing, or driven ashore. So close inshore did the engagement take place that enemy batteries opened fire, though without effect. As H.M. ships withdrew in daylight, enemy torpedo-carrying aircraft attempted to attack, but were intercepted by naval fighters from the escort carriers. One enemy aeroplane was shot down, two British were lost, but both pilots were rescued.

A similar enterprise, reported on January 30, was that carried out by Captain S. H. T. Arliss, R.N., in H.M.S. Berwick with the escort carriers Campania and Nairana in company. Naval aircraft, flown from the carriers, severely damaged enemy supply ships with bombs and rockets north of Stadtlandet (Norway) and attacked gun sites and other inshore installations. H.M. ships and aircraft sustained no damage or casualties.

On that date, too, Admiral Burrough told his first Press Conference as Allied Naval C.-in-C., that Captain A. F. Pugsley, R.N., who had been in command of the Walcheren assault, was being continually active in small-scale operations among the Dutch Islands to the north of that locality; also that British and American naval parties were already being prepared to restore such ports as Rotterdam, Hamburg, and Bremen after the enemy had been driven out.

The U-boat pens at Bergen (Norway) were attacked by the R.A.F. with 12,000 lb. bombs on January 12. Direct hits were seen and an enemy vessel was sunk.

MEDITERRANEAN.

On January 6, the destroyers H.M.S. Lookout and U.S.S. Woolsey bombarded enemy batteries in the Massa area, south-east of Spezia, with good results. U.S. Thunderbolts secured direct hits on the converted liner Roma, renamed as an aircraft carrier the Aquila, leaving her burning off Genoa.

A French *communiqué* of January 19, reported that the cruisers Montcalm and Georges Leygues and the destroyer Trombe, in operations off two Italian ports, had sunk several enemy ships and damaged military installations.

INDIAN OCEAN.

On January 3, a seaborne landing by a British Commando force, without enemy opposition, occupied Akyab—the third largest port of Burma. This was a valuable acquisition, as it gave the 14th Army a useful supply port capable of accommodating vessels up to 8,000 tons, and a network of airfields which the Japanese had used for raids on Calcutta. It also removed the last enemy advanced post threatening India.

The following day it was reported that British carrier-borne aircraft had bombed the Pangkalan Brandan oil refinery in northern Sumatra, wrecking the power-house and other plants and starting large fires. Seven Japanese fighters were shot down without loss. Later in the month, what was described by S.E.A.C. as " the heaviest blow to date at Japanese oil supplies of major importance for the Far Eastern and Pacific war" was struck in two successive operations by naval aircraft from a powerful force of the East Indies Fleet under the command of Rear-Admiral Sir Philip Vian. The first attack took place against the Sumatran oil refineries at Pladjoe on January 24, and strong enemy interception was met; thirteen Japanese fighters were destroyed in combat and thirty-four on the ground. Opposition to the attack on the refineries at Soengei Gerong and in the Palembang area, on January 29, was weaker; eight enemy aircraft were destroyed in the air and four on the ground. Both attacks were pressed home in the face of heavy A.A. fire and balloon barrages. Direct hits were scored and big explosions and fires seen. Fifteen naval aircraft were lost. The ships which took part in these operations included the battleship King George V; the aircraft carriers Illustrious, Victorious, Indomitable, and Indefatigable; the cruisers Argonaut, Black Prince, and Euryalus; and the destroyers Grenville, Kempenfelt, and Ursa. This was the first occasion on which it had been made known that some of these—the Navy's biggest and newest ships—were in Eastern waters.

On January 20, the Admiralty announced that during recent patrols British submarines has sunk another 84 ships—many of them small supply vessels—carrying petrol, ammunition, and food to Japanese forces in Burma and on enemy-held islands in Far Eastern waters. They had also bombarded shore installations.

FAR EAST AND PACIFIC.

During the month of January, the U.S. Navy actively supported and supplied the military forces engaged in completing the recapture of the Philippines, especially the northern island of Luzon. After a "heavy bombardment of shore installations by a powerful Allied fleet, including battleships, cruisers, destroyers, and rocket-firing craft, and heavy bombing by Allied aircraft, lasting for several hours," very large forces of Lieut.-General Krueger's U.S. 6th Army, under the personal command of General MacArthur, landed in Lingayen Gulf on the morning of January 9. Four beaches were seized with very little ground resistance. The naval escort of the invasion armada included H.M.A. cruiser Shropshire and H.M.A. destroyers Arunta and Warramunga under Commodore H. B. Farncombe. During the approach through the Mindanao Strait and along the west coast of Mindoro, and also during the landings, the convoy was heavily attacked by Japanese aircraft and naval light craft, and suffered some damage. The enemy lost 79 aircraft, 2 destroyers, a midget submarine, and other vessels.

This landing was an obvious threat to the capital—Manila, 120 miles to the south—and to the important naval base of Cavite. It also enabled the Americans to build up on the beachhead vast stores of military supplies for further penetration of the island. These were ferried ashore by a great flotilla of amphibious craft. A number of "suicide" attempts were made against the Allied ships. Individual Japanese or small groups, putting out in rowing boats or swimming, tried to throw hand grenades on to the decks or to attach T.N.T. charges to the hulls. Attempts were also made to ram Allied vessels with barges filled with dynamite. Most of these efforts proved fatal to the attackers and the damage done by them was small.

On January 11, U.S. carrier-borne aircraft assisted in bombing key points and bridges on the Lingayen–Manila railway, and the Manila airfields. The ports on the north-east shore of Lingazen Gulf—Baguio, San Fernando, and Rosario, were subjected to a heavy naval bombardment and air attack. U.S. warships continued to shell Japanese batteries in this area, which attempted to bring the beachhead under fire.

Another, and completely unopposed landing, was made on the morning of January 29, on the west coast of Luzon between San Felipe and San Miguel. The convoy of 150 ships, escorted by cruisers, destroyers, and aircraft, did not encounter a single enemy aircraft or ship throughout the voyage of more than half the length of the Philippine archipelago, and neither naval bombardment nor air bombing was necessary before the landing—a clear indication that the Allies had recovered complete command of the sea and air in this theatre of war.

Yet another landing in the same vicinity took place on January 31. This was made by an amphibious force which went ashore at Nasugbu—32 miles south-west of Cavite naval base. These two landings sealed off all possibility of the Japanese south of Manila linking up with those further north, and outflanked the enemy defences in South Luzon.

U.S. carrier aircraft continued to be in the forefront of the American advance towards Japan, and on January 2 and 3, a task force under Vice-Admiral McCain used them to strike "in great force" at Formosa and Okinawa—the largest of the Ryuku (Luchu) Islands, and mid-way between Formosa and Japan. At the same time naval aircraft reconnoitred over 500 miles of the Chinese coast from Formosa to Hong Kong from a low level and without enemy interference. During these attacks 111 Japanese aircraft were destroyed, and 220 damaged, 27 enemy ships sunk, and 68 damaged ; the rail system and 24 airfields on Formosa were also bombed. American losses were not stated. These two islands were bombed again by carrier aircraft on January 9, and subjected to a particularly heavy attack from carriers of the U.S. Third Fleet on January 20 and 21. Admiral Nimitz's Headquarters, reporting on these latter operations, said that, for the loss of 15 American aircraft, the following results had been achieved : Formosa—60,000 tons of Japanese shipping destroyed (including 6 oilers and 10 cargo ships), 47 enemy aircraft shot down, 102 destroyed, and 162 damaged on the ground ; Ryuku Islands—29 vessels sunk, 41 damaged, 68 aircraft destroyed or damaged. The same *communiqué* announced that on January 24, U.S. aircraft had also bombed Iwo Jima (Bonin Is.), Babelthuap (Palaus), and Yap (Carolines).

This *communiqué* was the first issued from Admiral Nimitz's new headquarters, officially described as "C.-in-C. Pacific Areas Advanced H.Q." At the time, these were discreetly described as "well west of Pearl Harbour," but later proved to be at Guam.

Forerunners in the recovery of British naval bases in the Far East were the U.S. bombing attack by aircraft from India made on Singapore on January 11, and the bombing of Hong Kong by American carrier aircraft on January 13. This latter force, on the previous day, had attacked Japanese shipping off Indo-China, sinking 41 vessels, damaging 28, and shooting down 112 enemy aircraft at a cost of 16 U.S. aircraft.

During the month, the Japanese Navy suffered further losses. On January 11, Admiral Nimitz announced that, in the course of attacks on four convoys off Indo-China, carrier aircraft of the Third Fleet had sunk 25 Japanese ships, including a "Katori" class cruiser and several destroyers and destroyer escorts. He also confirmed the destruction of the new 45,000-ton battleship Musashi by air attack during the battle for

Leyte Gulf in the previous October, and that her sister ship, the Yamato, had been damaged. The U.S. Navy Department announced, on January 18th, that American submarines operating in the Far East and Pacific had sunk another 24 Japanese ships, including 1 destroyer and 3 destroyer escorts. Further U.S. submarine successes were made known on January 27 ; these included a light cruiser.

A report from Melbourne, on January 14, made known the fact that Admiral Sir Bruce Fraser, C.-in-C. of the British Pacific Fleet, had narrowly escaped death when he was on the bridge of an American warship watching the Luzon operations. He was knocked down by the blast of a bomb which killed Lieut.-General Lumsden and Mr. W. Chickering—correspondent of *The Times*, with whom he had been talking a few seconds earlier, but he was not injured.

The Australian Premier, Mr. Curtin, announced, on January 26, that the cruiser H.M.A.S. Australia and the destroyer H.M.A.S. Arunta were damaged by enemy air attack during the invasion of Luzon. Casualties in the Australia amounted to 27 killed, 17 missing (presumed killed), and 69 wounded ; in the Arunta, 2 killed and 5 wounded. Despite the damage (the Australia was holed five times) neither warship withdrew until the operations were concluded.

LOSSES.

During the month of January, the following warships were reported to have been lost—

British—Destroyer—H.M.S. Aldenham. Frigate—H.M.S. Capel, in "operations for the liberation of Europe."

United States—Destroyer—U.S.S. Reid, in action in the Philippines area. Submarine—Harder.

FEBRUARY.

The joint monthly report, issued by Mr. Churchill and President Roosevelt, on the war against U-boats, said: "During February a moderate number of Allied merchant vessels fell victim to U-boat activity. However, the anti-submarine forces were successful in destroying more enemy submarines than in January. Despite satisfactory results now being obtained in the war on under-sea raiders, our forces must maintain unceasing vigilance, because any enemy with a large number of submarines always possesses a potential threat."

A report by the German High Command, on February 9, that the armoured ships Lützow (formerly the Deutschland) and Admiral Scheer were supporting the garrison at Elbing, was of interest as indicating that these useful units of what remained of the enemy surface fleet were still in fighting condition. It will long be a matter for surprise that the German Navy made no attempt to use the whole weight of the fleet to interfere with the Allies' invasion, seeing how much was at stake.

Norwegian commandos, smuggled into Norway from Britain, carried out a most daring exploit during the week-end of February 10–11. In broad daylight, they boarded twelve tugs at Fredrikstad (S. Norway), drove the crews below with tommy guns, steamed out to sea under the noses of the Germans, and set course for Sweden. On the way, they fell in with the Norwegian salvage vessel Uredd, which they boarded in the outer Oslo Fjord. They took this ship and nine tugs (three had to be scuttled for lack of fuel and water) to the Swedish port of Strömstad, where they were given up and interned. The commandos returned to Norway in a fishing smack.

The sinking of another Japanese prison ship, with 1,500 Americans on board, was made known in Washington on February 22. The vessel was mistaken for a cargo ship when she was attacked in the Philippines on December 15 by U.S. bombers. Fewer than half the prisoners survived, and of those who did the majority were recaptured. An American naval officer, who was saved, said that the prisoners were crowded to suffocation and kept in the holds at the point of tommy guns. Two previous sinkings of prison ships in the Pacific were due to U.S. submarines being unable to recognise what they were.

On February 13, the Admiralty announced the appointment of Admiral Sir Geoffrey Layton, formerly C.-in-C. Ceylon, to be C.-in-C. Portsmouth in succession to Admiral Sir Charles Little.

Following on the creation of the "5-star" rank of Fleet Admiral of the Navy—the equivalent of the British Admiral of the Fleet—it was made known that the first appointments to this rank were Admirals King, Nimitz, and Leahy. Contemporaneously, Generals Marshall, MacArthur, and Eisenhower received the new rank of General of the Army—the equivalent to that of British Field Marshal.

ARCTIC.

The successful double passage of a convoy between Britain and Russia, despite strong attacks by U-boats and torpedo-carrying aircraft covering several days, was made known by the Admiralty on February 16. The escorting warships were under the command of Rear-Admiral R. R. McGrigor, flying his flag in the escort-carrier Campania. In these operations two U-boats were definitely sunk—one by aircraft from H.M.S. Campania, the other by H.M. corvette Bamborough Castle, and three enemy aircraft destroyed—two Ju. 88's by gunfire from the cruiser H.M.S. Bellona and destroyers, and a reconnaissance aircraft by fighters from H.M. escort-carrier Nairana. Despite the bad weather prevailing, determined action by H.M. warships and aircraft prevented a single attack being launched on the convoy; this consisted of British and American ships under the command of a Norwegian Convoy Commodore.

A report from Ottawa on February 13, made known that the Canadian corvette, St. Thomas, had recently sunk a U-boat in the North Atlantic; 55 of the crew were picked up by the St. Thomas and the corvette H.M.C.S. Seacliff.

MEDITERRANEAN.

H.M. destroyers Exmoor and Ledbury landed British and Greek troops on the Dodecanese island of Nisiro, south of Cos, to round up a German raiding party of about 40, which had crossed from a neighbouring island in search of food and supplies. The Germans lost 8 killed and 30 prisoners, and their motor-launch was sunk.

Between February 19 and 22, British, American, and French warships carried out a number of bombardments of the French-Italian frontier, in which the French cruiser Georges Leygues scored direct hits on the Excelsior Hotel at San Remo and bombarded the port of Ventimiglia.

Under cover of gunfire by H.M. destroyer Liddesdale and rocket fire from Beaufighters, Allied troops landed on the island of Piskopi (Tilos), N.W. of Rhodes, and after stiff initial opposition captured it.

INDIAN OCEAN.

It was made known on February 1, that U.S. Super-fortresses, flying from India, had made their heaviest attack on Singapore to date. Subsequent photographic reconnaissance showed that they had sunk the 50,000-ton floating dock. This had been towed the 8,000 miles from Southampton before the war, and was scuttled before the Japanese occupation of Singapore in 1942, but had been raised by the enemy.

FAR EAST AND PACIFIC.

The American advance across the Pacific reached the mainland of Japan when, at 7 a.m. on February 16, a powerful force including a large number of carriers with supporting battleships, cruisers, and destroyers moved up to within 300 miles of Honshiu, and subjected Tokio and Yokohama to incessant bombing for nine hours. This operation was carried out by 1,500 aircraft, flown from fifteen to twenty carriers, attacking in continuous waves. U.S. despatches reported very heavy damage in both towns, with smoke rising to 7,000 feet. Further details, given in a *communiqué* from Admiral Nimitz, published on February 19, included the fact that the force engaged was the U.S. 5th Fleet with units under the command of Vice-Admirals Spruance and Mitscher. The statement also said that amongst the results achieved were: the destruction of 332 Japanese aircraft in combat, 177 on the ground, and at least 150 probably destroyed on the first day, and an unknown number damaged on the second day; an escort-carrier left ablaze and sinking at Yokohama; 9 coastal vessels, a destroyer, 2 destroyer escorts, and a cargo ship sunk; and a number of other craft damaged. Considerable destruction was caused to airfields and shore establishments. The attacks, pressed home under cover of adverse weather, achieved complete tactical surprise. All enemy attempts to attack the U.S. task force were driven off by air patrols, and not a single ship was damaged. The entire operations were carried out at a cost of 49 American aircraft and 30 to 40 pilots.

Iwo Jima in the Volcano Islands—the important advanced base for the home defence of Japan—was invaded at 9 a.m. on February 19, by the U.S. 5th Amphibious Corps, composed of the 4th and 5th Marine Divisions. The island had been subjected to naval bombardment and air-bombing for the four previous days, and the armada of landing craft went in under "massive" naval and air support. A firm foothold, 4,500 yards wide, was established on the south-east coast against only light resistance during the first two hours; after that it stiffened greatly. Hand-fighting developed as the Marines advanced towards the Motoyama airfield—an important objective, but by the end of the day a third of Iwo Jima was in American hands. Vice-Admiral Richmond K. Turner was in overall command of the operations, which were supported by over 800 warships; among these were the battleships U.S.S. Tennessee, Idaho, Nevada, New York, Texas, and Arkansas, most of them commanded by Vice-Admiral Spruance. The rain of shells, rockets, and bombs was such that the whole island was described as being covered by smoke as the landing took place.

The following day, the U.S. Marines, overcoming fanatical resistance, captured the Motoyama airfield and drove a wedge 2½ miles wide at its base into the S.E. part of the island. But the Japanese, despite constant naval bombardment and air attacks, continued to defend their positions with fighting described as being "comparable in ferocity with that at Tarawa": it was obvious that they realised what the loss of the island would mean to the security of Japan itself. By February 22, 45,000 to 60,000 American Marines had been landed, but not without some damage to American ships by enemy aircraft, which succeeded in penetrating the protective screen of A.A. fire and fighters. By the end of the month, it was announced, half the island was in American hands; 3,658 Japanese dead had been counted and only 8 Japanese prisoners had been taken.

On February 25, a strong force of carriers of the U.S. 5th Fleet, commanded by Vice-Admiral Mitscher, with Admiral Spruance in overall command, again launched a large number of aircraft against the Tokio-Yokohama area. They were joined at mid-day by over two hundred Super-fortresses which struck at the heart of Tokio in a snowstorm. H.E. bombs and incendiaries fell in the vicinity of the Emperor's palace, and Tokio radio said, after the raids, that Koiro—the Japanese Premier, had called on the Emperor to express his " anger at the enemy's arrogance and lawlessness " and to offer his Cabinet's apologies "for unforgivable negligence."

The next day the same carrier force bombed targets on Hachijo Jima—an island 175 miles south of Tokio. Reporting on the results of these two-day operations, Admiral Nimitz said that 158 enemy aircraft were destroyed (121 on the ground) and 75 damaged, 5 small ships sunk, the aircraft assembly plant at Ota—47 miles north-west of Tokio—and the nearby Koizumi plant were left in ruins, and the Nakajima and Musashima engine factories were levelled to the ground, for the loss of nine U.S. aircraft; five pilots were saved.

All these operations constitute a striking example of the extent to which a modern fleet with powerful carrier-borne air forces can carry war into an enemy's country; and that, in certain circumstances, it can do this more effectively or sooner than it can be done by land-based aircraft. The extraordinary success which U.S. carrier-borne aircraft had achieved against the Japanese air force was apparent when it was made known by the Navy Department, on February 27, that, since December 1, 1944, aircraft of the U.S. 3rd and 5th Fleets had destroyed 1,610 Japanese aeroplanes, and damaged 1,078. In the same period they had also sunk 187 ships and probably sunk or damaged 402 ships; all for the loss of 178 American aircraft.

Admiral Sir Bruce Fraser, C.-in-C. British Pacific Fleet, while on a visit to Auckland (N.Z.), made known that his fleet, operating as a separate British unit under American command, constituted the fourth fleet fighting the Japanese; also that aircraft carriers provided approximately half its strength in big ships, and that all operational units in the Royal New Zealand Navy, including H.M.S. Achilles and H.M.S. Gambia—lent from the Royal Navy—were under his command.

On February 17, it was announced in Melbourne that long-range Australian Catalinas had, in the past few months, closed, at least temporarily, every important enemy harbour in the East Indies by extensive minelaying operations at night, and, following a recent minelaying expedition, had bottled up a Japanese fleet consisting of four battleships, an aircraft carrier, six cruisers, and many destroyers in the South-West Pacific. By disrupting enemy sea communications and taking a heavy toll of his shipping, they had helped to pave the way for the Allied victories in this theatre of the war. All these operations, it was stated, were carried out at the express request of the U.S. Navy, the Australian aircraft being the only heavy type employed in minelaying in that theatre.

The Navy Department announced, on February 14, that U.S. submarines had sunk another 31 Japanese ships, including a converted light cruiser, a gunboat, and an escort-vessel. Further successes, made known on February 21, were the sinking of 25 Japanese ships, among which were an escort-carrier, a destroyer, and a large converted cruiser. During the month, it was also made known that U.S. submarines had kept regular contact with the resistance movement in the Philippines while they were being occupied, and had brought away over five hundred women and children assembled from all parts of the islands without the enemy's knowledge.

LOSSES.

Warship losses reported during February were :—

British—Submarines Stratagem and Porpoise. Minesweeper Regulus and Treern (South African Navy).

The Porpoise, during the critical days of the siege of Malta, had made several supply runs with vital aviation spirit and munitions. She had also sunk some 35,000 tons of enemy shipping since the beginning of the war. When " overdue from patrol and presumed lost," she was commanded by Lieutenant-Commander H. B. Turner, D.S.C.

United States—Escort-Carriers—Ommaney Bay and Bismarck Sea. Destroyers—Cooper, Mahan, Ward. Submarines Growler, Escolar, and Shark. Minesweepers Long, Hovey, and Palmer.

The Ommaney Bay was sunk on her way to take part in the Luzon operations, and the Bismarck Sea off Iwo Jima ; both by Japanese aircraft, the latter being attacked by 68 of them.

The destroyers were all lost at an earlier date during the Leyte operations, and all were sunk by air attack.

MARCH.

March 24, 1945, will always remain one of the historic dates of the war, for at 1 p.m. on that day SHAEF issued a *communiqué* saying that Allied forces were crossing the Rhine, north of the Ruhr, on a wide front. The operations, added the announcement, were being " assisted by the Allied Navies. . . ." It was explained that, after careful experiments on British, French, and Belgian rivers most resembling the Rhine in banks and currents, it had been decided to use two main types of amphibious craft for the crossing—Landing Craft Mechanised (L.C.M.) and Landing Craft Vehicle Personnel (L.C.V.P.). These were selected as the most suitable for maintaining a fast cross-river service of tanks, mobile guns, and bulldozers. Both types have bows which can be lowered to form ramps for loading and unloading, and a very fast turn round is possible. The L.C.M. are 50 feet long, have a speed of 12 knots, and can carry the equivalent of a Sherman tank. The L.C.V.P. are 36 feet long, have a speed of 10 knots, and can carry forty fully-equipped troops, or a bulldozer, or 1,000 gallons of petrol. The craft with their crews were brought some two hundred miles overland. The senior British and American naval officers in charge were respectively Captain P. G. H. James, R.N., and Commander William J. Whiteside, U.S.N.

The Prime Minister was at Field Marshal Montgomery's headquarters during the crossing, and on March 26 the King sent a message to the Supreme Commander in which His Majesty referred to the operation as " a military achievement of incalculable significance to the whole world."

The Allied statement on U-boat warfare for the month said : " During March the U-boat effort continued to increase, but fewer successes were obtained against our shipping than in February. Casualties inflicted on U-boats were again severe and the prolonged and extensive bombing and minelaying policy of the Allies has undoubtedly delayed the introduction of the new type of U-boats. In a similar manner the capture of Danzig by the Soviet armies helps to cut off the evil at its source."

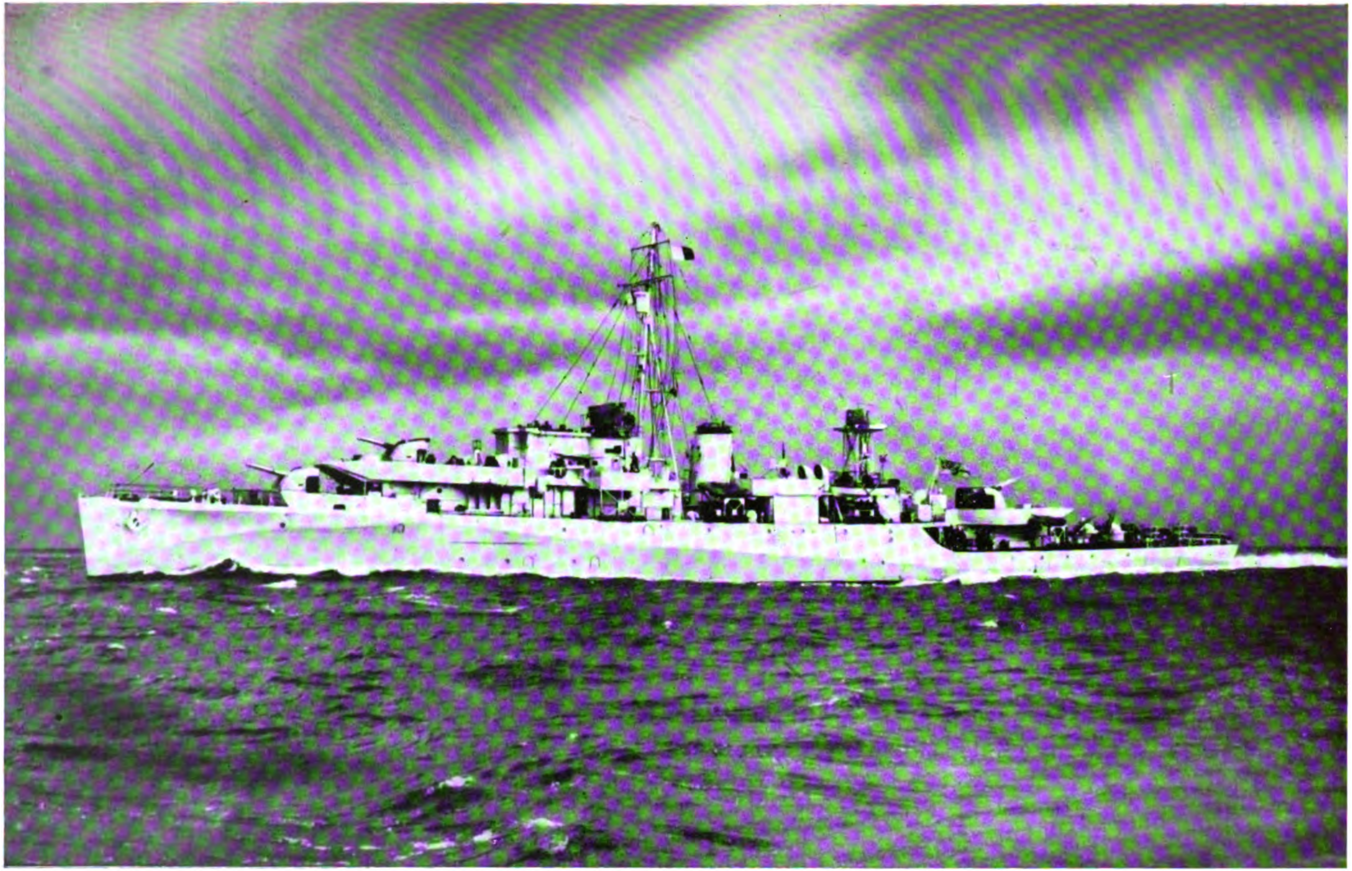
A categorical statement received *via* Stockholm from underground Norwegian sources asserted that one of the latest German submarines, U-1053, had sunk while doing trials in Byfjord near Bergen. Commander Spilder, chief of the 11th U-boat Flotilla, 22 naval and engineering experts, and a crew of 58 were on board. The submarine was said to be fitted with a number of new devices, including special gear to facilitate rapid submerging and surfacing.

The Admiralty made known that, from 1943 onwards, and in the most critical days of the Battle of the Atlantic, an important part had been played in defeating the U-boats by Merchant Aircraft Carriers—known as M.A.C. ships. These merchant ships, while carrying their normal cargoes, also acted as escort-carriers, being fitted with flight decks for launching and landing fighter aircraft. The latter were operated by the Naval Air Arm under the command of the Masters. The original purpose of the M.A.C. ships was to provide air cover for themselves and other vessels while in the 500-mile " air gap " in the Atlantic out of range of land-based aircraft. For structural reasons, the vessels used were grain ships and tankers.

An interesting sequel to the sinking of the Tirpitz by the R.A.F. was the publication of the fact that she had been located in Tromsö Fjord, where she was sunk, by naval aircraft from the new carrier H.M.S. Implacable, which had not long joined the Home Fleet.

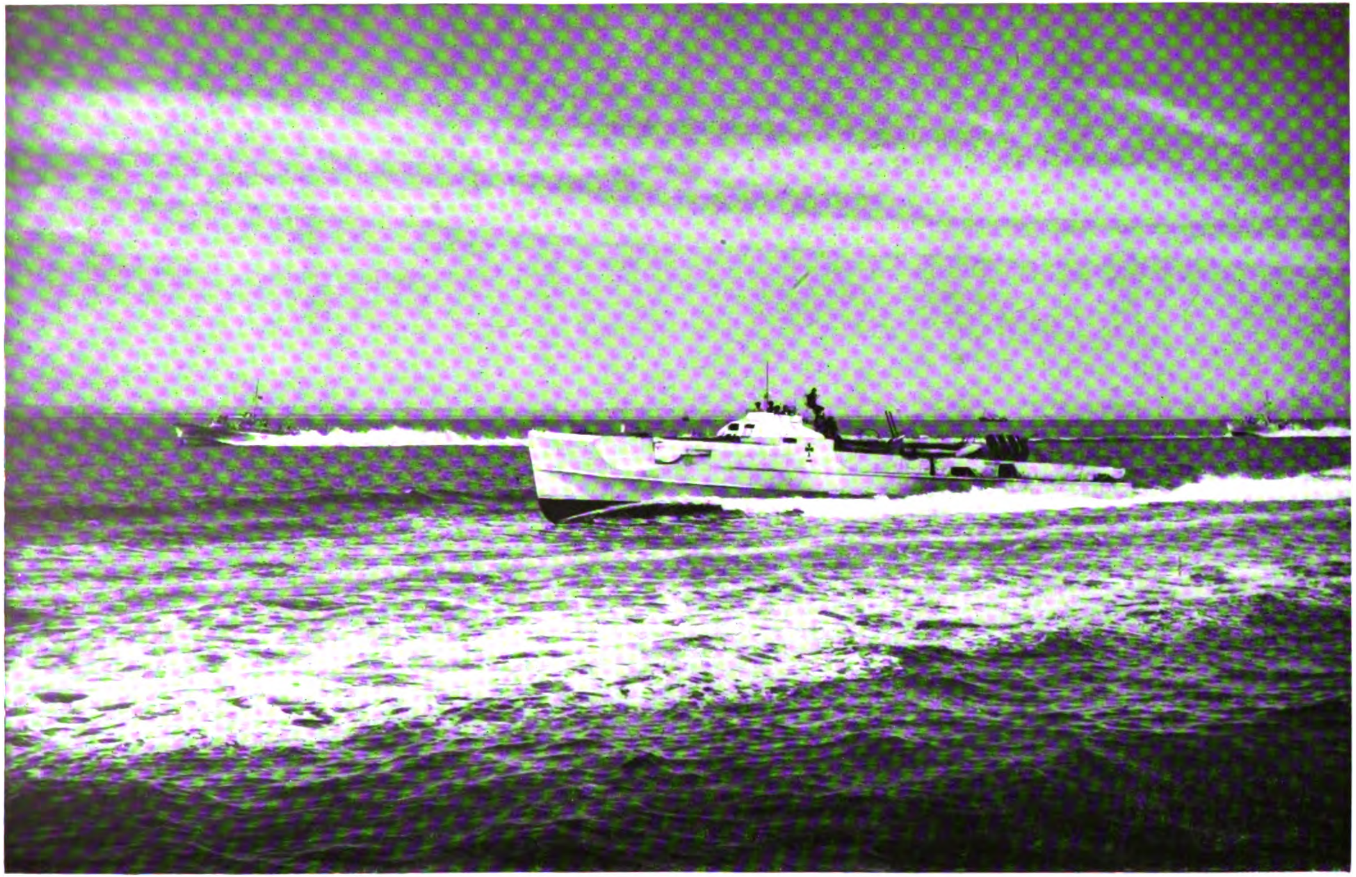
HOME WATERS.

Throughout the month naval and air forces were repeatedly engaging E-boats attempting to interfere with the Allied supply lines to the Continent. The Admiralty announced that on March 1, an E-boat had been sunk by H.M. frigate Seymour off Ostend in one of these actions, and another had been accounted for earlier in that week by H.M. frigate Riou. Strong formations of E-boats put out from the Dutch coast during the dark hours of March 17. They were brought to action by light coastal forces co-operating with British-based Wellingtons and Belgian-based Coastal Command Swordfish aircraft, and driven into harbour. In the conditions prevailing it was difficult to assess results. A brisk encounter with E-boats occurred four days later when combined action by the Navy and Air Force during the night successfully defended a convoy off the East Coast from an attack by enemy craft in considerable strength. Contact was first made with several groups of E-boats, moving west from the Texel and Hook of Holland areas, by Wellingtons, Beaufighters, and naval aircraft. One E-boat was set on fire and others sunk. North-west of Den Helder another enemy force was attacked by Beaufighters and several E-boats were hit, one blowing up. The convoy escort took up positions to intercept the enemy, and in a series of lively gun actions repeated hits were obtained on E-boats by H.M. destroyers Vivacious, Holderness, and Albrighton, and H.M. corvette Puffin. The enemy was driven off without being able to reach the convoy. H.M. ships suffered no damage or



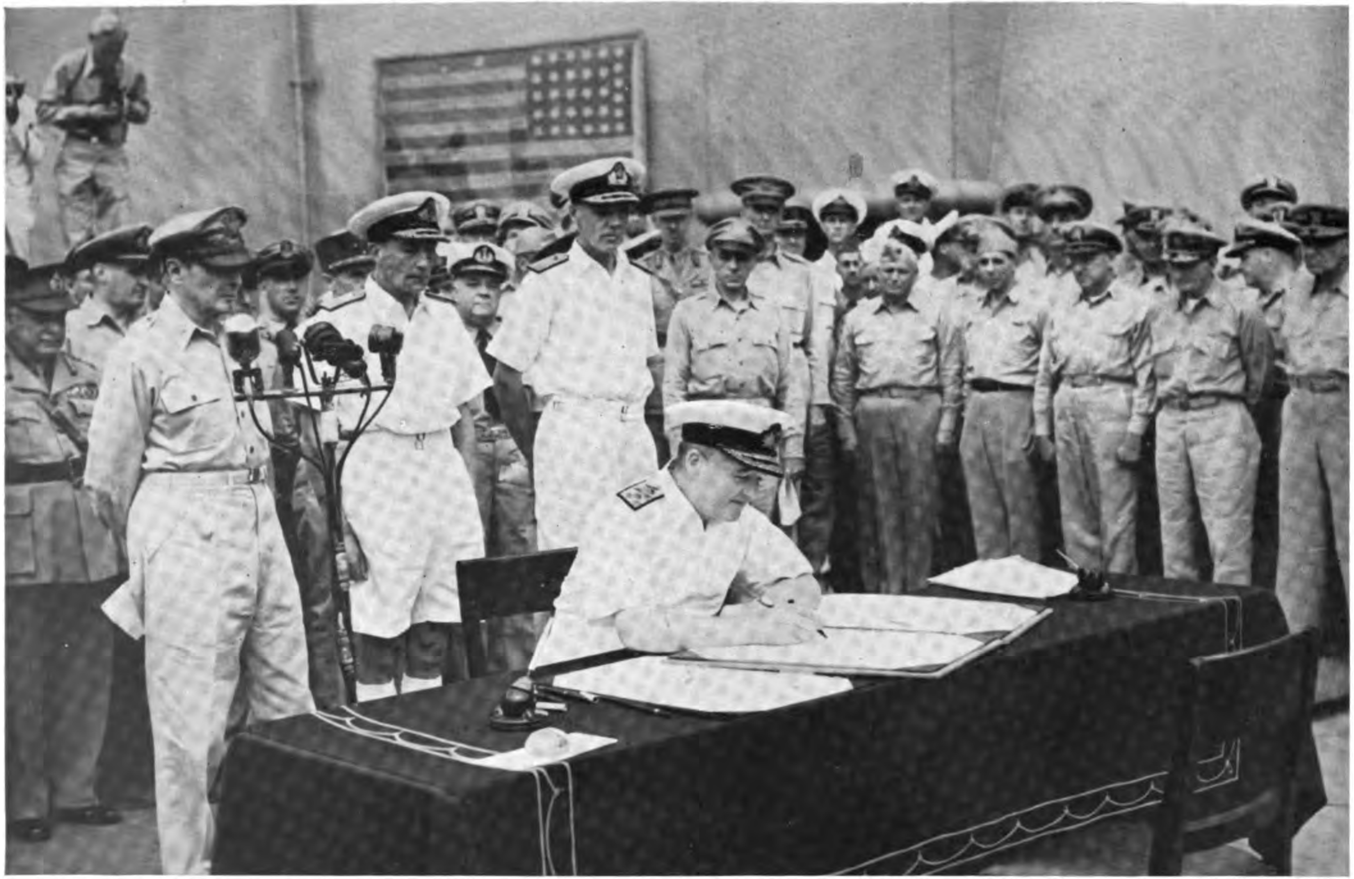
H.M.S. Magpie, Sloop.

(Courtesy of Messrs. Thornycroft.)



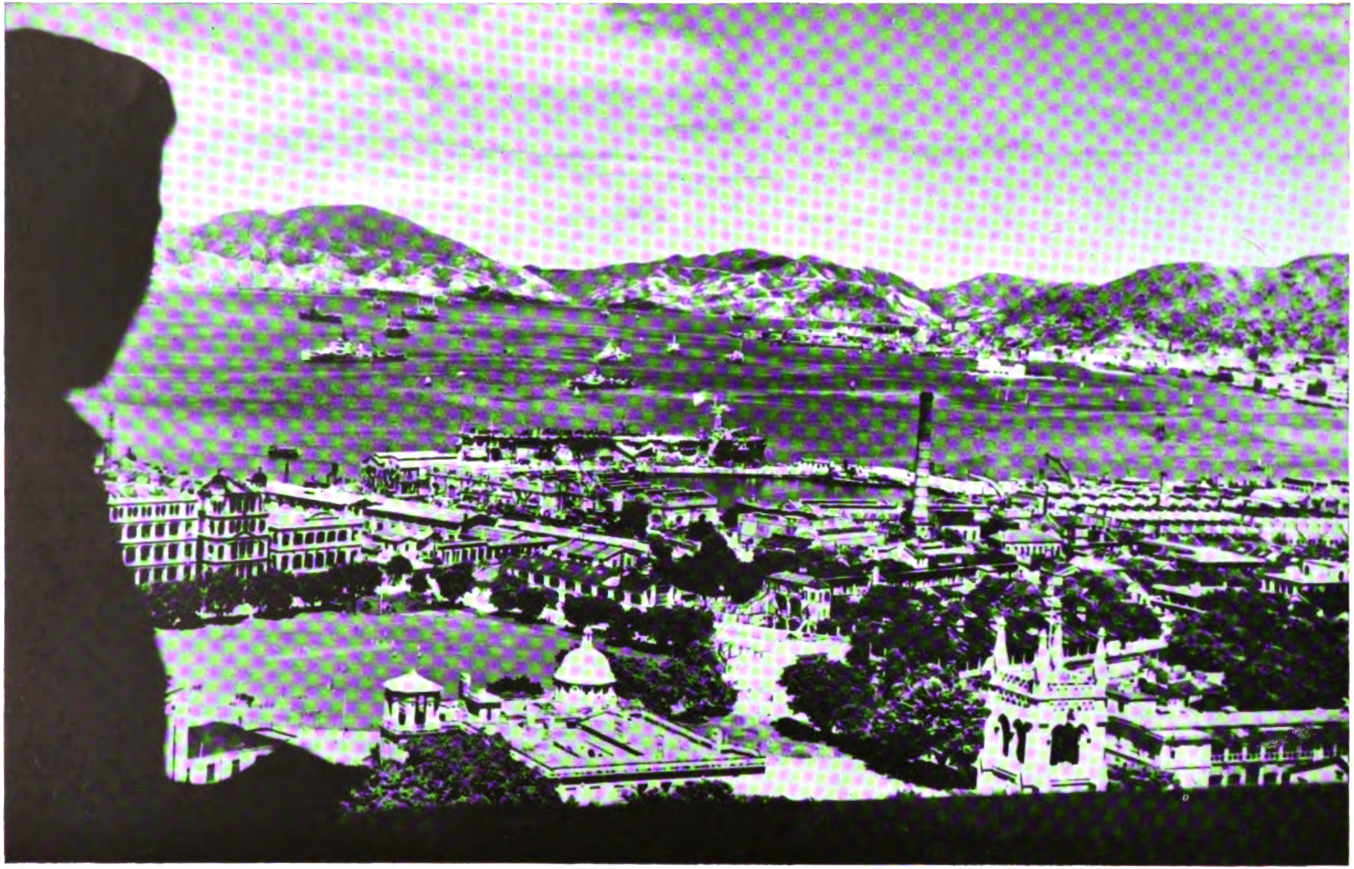
E-boat escorted in to surrender by British M.T.B.

(*British official photograph. Crown copyright reserved.*)



Surrender in Tokyo Bay, Admiral Sir Bruce Fraser signing on behalf of the United Kingdom. Vice-Admiral Sir Bernard Rawlings and Rear-Admiral Brind behind. General MacArthur looks on.

(British official photograph. Crown copyright reserved.)



Hongkong liberated. British squadron in the harbour seen from the balcony of Government House.

(British official photograph. Crown copyright reserved.)

casualties. On March 27, E-boats, operating from Dutch bases, again made an attempt on the Allies' supply lines and were again driven off by a naval force which on this occasion included H.M. frigate Riou, the Polish and Norwegian destroyers Krakowiak and Arendal, and British M.T.B.s. Two E-boats were left ablaze, the Allied ships were untouched.

The Norwegian high command asked for the assistance of the Royal Navy in rescuing some 500–600 men, women, and children who had been left stranded on Söroy Island, off the Finmark Coast, where the Germans, in their retreat from Northern Norway, had destroyed almost all the buildings. This was done without a mishap, and the inhabitants brought to Britain.

Light Coastal Forces of the Norwegian Navy continued to harass German convoys off Norway. On March 13, it was reported that in one of these attacks they had torpedoed two supply ships which were left burning fiercely. Later in the month they intercepted a north-bound convoy consisting of a medium-sized supply ship, an armed trawler, and a " gun coaster." All three vessels were hit by gunfire and torpedo. The Norwegians sustained no damage in either engagement.

On March 30, U.S. heavy bombers attacked Bremen and Wilhemshaven, and on March 30 and 31, U.S. and R.A.F. bombers attacked Hamburg. According to a report from 8th U.S.A.A.F. Headquarters, twenty-one German naval and merchant ships were sunk and others damaged during these attacks; amongst them were the cruiser Köln—left bottom-up in Wilhelmshaven; seven U-boats sunk at Bremen; one U-boat sunk and three damaged at Hamburg. Reconnaissance photographs also showed widespread damage to U-boat building yards and naval repair facilities at all three ports. Subsequently there was a five-day search by over 170 Allied aircraft and four British naval launches for six American airmen who had baled out of a Catalina flying boat over the North Sea. They were rescued on April 5.

ARCTIC.

Emphasing the indispensable help given to Russia by the Navy, the First Lord—Mr. A. V. Alexander—on March 27, announced that under British command and almost entirely under British escort, 739 loaded cargo ships had sailed for North Russian ports; and that in spite of constant battles against enemy aircraft, U-boats, and surface forces, and " frightful " Arctic gales, 677 had arrived safely. He also made known that, during these operations, the Royal Navy had lost 2 cruisers, 5 destroyers, 8 escort vessels, and an oiler; and that 1,156 R.N. officers and men, and hundreds of Allied merchant seamen had lost their lives on the North Russian convoy route.

On March 31, the Admiralty announced that in spite of one of the most sustained and persistent attacks by U-boats and enemy aircraft in Northern waters, another large convoy laden with war supplies for Russia had recently fought its way through to Murmansk without loss. The enemy also maintained his attacks on the return journey, but despite some losses, over 94 per cent. of the ships in convoy made their destination safely. During the operations, which were carried out in a period of exceptionally severe weather (at times a 100 m.p.h. gale was blowing), a U-boat was sunk by gunfire and depth charges from the sloop H.M.S. Lark and the corvette H.M.S. Alnwick Castle, while twelve Ju. 88's were shot down by naval aircraft from the escort-carrier Nairana and gunfire from H.M.

destroyers Onslow, Onslaught, Orwell, Whitehall, H.M.C.S. Sioux, and the corvette H.M.S. Denbigh Castle. The corvette H.M.S. Bluebell was torpedoed and sunk and two naval aircraft lost. The British force was commanded by Rear-Admiral R. R. McGrigor, flying his flag in the escort-carrier Campania.

MEDITERRANEAN.

An official announcement from Allied Mediterranean Headquarters stated that, on March 2, the French cruisers Montcalm, Georges Leygues, and Jeanne d'Arc had successfully bombarded the Franco-Italian frontier area, scoring hits on Bordighera station, a nearby tunnel and an enemy armoured train.

The same source made known that on the night of March 15–16, H.M. destroyers Milne and Meteor bombarded the port of Genoa; also that during the past ten days successful bombardments of the Franco-Italian frontier and targets on the Gulf of Genoa had been carried out by British, U.S., and French destroyers; and that north of Cap Corse (Corsica) H.M. destroyers Lookout and Meteor had engaged three enemy destroyers and sunk two of them.

Between March 27 and 31, British, U.S., and French destroyers again bombarded targets on the Franco-Italian frontier, and on March 31, the French cruiser Gloire bombarded San Remo harbour.

INDIAN OCEAN.

Destroyers of the East Indies Fleet bombarded Sigli (Sumatra) on March 17, and Port Blair (Andamans) on March 19; on March 26, in co-operation with Liberator aircraft, they sank an enemy convoy of two supply ships, escorted by two submarine chasers, in the Andaman Sea.

After a thirty-two day search by aircraft of the Naval Air Arm, R.A.F., and R.A.A.F. covering some 300,000 square miles, 142 survivors of a U.S. Liberty ship torpedoed in the Indian Ocean were rescued and eventually landed in Western Australia.

On March 15, the Admiralty gave the names of eleven officers commanding submarines, which during recent patrols in eastern waters had sunk 74 Japanese vessels (including a minelayer, two armed trawlers, a tanker, naval auxiliary, landing craft, etc.), damaged 25 others, and bombarded shore stations on Car-Nicobar (Indian Ocean) and Pulo Padang (Sumatra). A British submarine also fought a running gun action with an enemy convoy of five coasters and an armed trawler off the coast of Sumatra. The trawler and one coaster were sunk, and the other coasters driven ashore in flames.

FAR EAST AND PACIFIC.

It was officially announced, on March 7, that among the warships operating with the British Pacific and East Indies Fleets were the British battleships Howe, King George V, Queen Elizabeth, and Valiant; the French battleship Richelieu; the battle cruiser Renown; H.M. aircraft carriers Victorious, Illustrious, Indefatigable, and Indomitable; H.M. cruisers Argonaut, Black Prince, and Euryalus; and the Dutch light cruiser Tromp.

After a fortnight's fierce fighting the U.S. Marines were reported, on March 5, to be in control of four-fifths of the island of Iwo Jima; but 5,000 Japanese were fighting to the death to hold strips of the north and east coasts. The following day, under cover of naval and artillery bombardment the Americans made some headway; but it was not until March 16 that Admiral Nimitz could announce that this battle, "the costliest in the Pacific war," had been won. The U.S. Marine casualties were 4,189 killed, 15,308 wounded, and 441 missing. The Japanese losses exceeded 21,000—nearly all killed.

On March 1, U.S. troops landed on Palawan Island—between the Philippines and British North Borneo. They met with only slight resistance and seized two airfields; from these, it was pointed out in General MacArthur's *communiqué*, the Sulu Sea and also the sea lanes of the South China Sea between Japan and her conquests in S.E. Asia and the East Indies, could be controlled.

A bombardment by U.S. carrier aircraft of the chain of Ryukyu (or Luchu) Islands, between Japan and Formosa, was reported on March 3. During these operations, the U.S. force destroyed 4 Japanese aircraft in combat, and 37 on the ground, probably destroyed or damaged 50 more, sank a destroyer, a M.T.B., and 8 cargo ships, and damaged airfields and shore installations. The escorting battleships and cruisers at the same time bombarded Okinadaito—a small island 450 miles south of Japan. U.S. naval aircraft, from carriers of the 5th Fleet under Vice-Admiral Mitscher, repeated the attacks on the Ryukyu Islands on March 23 and 24. Among the targets on this occasion was the naval air base at Okinawa. A Japanese convoy of eight ships, which included two destroyers, and three destroyer escorts or gunboats, was also wiped out. These attacks were, in fact, leading up to an assault on the more important of the islands. They culminated on March 26 and 27, in naval air attacks, in which the British Pacific Fleet took part with the U.S. 5th Fleet, under the overall command of Admiral Spruance. The British force was commanded by Vice-Admiral Sir Bernard Rawlings, with the aircraft carriers under Rear-Admiral Sir Philip Vian. This force concentrated on the Saki Islands—off the north end of Formosa. In the course of the operations twenty enemy aircraft were destroyed on the ground, and the town of Ohama was left in flames. Among the Allied ships engaged were the King George V and the aircraft carrier Illustrious.

U.S. carrier aircraft, on March 18 and 19, attacked the Japanese fleet in its home waters in the Inland Sea of Japan, inflicting "crippling damage." After a preparatory attack on enemy airfields at Kyushu on the first day, a fast carrier task force under Vice-Admiral Mitscher launched its aircraft against the enemy fleet, and damaged a 45,000-ton battleship of the new "Yamato" class, 2 or 3 aircraft carriers, 4 escort-carriers, 2 cruisers, 4 destroyers, 1 destroyer escort, 1 submarine, and 7 freighters; 6 freighters were definitely sunk. In addition 200 enemy aircraft were shot down in combat, 275 destroyed on the ground, and many others damaged. A large number of shore installations—hangars, arsenals, oil tanks, etc., were destroyed. The American aircraft losses were officially described as "extraordinarily light." One U.S. warship was seriously damaged by enemy air attack, but was able to return to port under her own power. According to the Japanese report, 1,400 U.S. aircraft took part in these attacks.

On March 27, the U.S. Navy Department made known that the 10,000-ton cruiser Honolulu had been seriously damaged by a torpedo from a Japanese aircraft during the invasion of Leyte; 65 of her crew had been killed and 47 wounded. She had made her way to the United States under her own steam and was then under repair.

American submarine successes were announced—on March 9, 12 Japanese vessels, including an escort-carrier and a destroyer; on March 19, 15 enemy vessels, including 3 destroyers and 2 escort ships; and on March 30, a large Japanese aircraft carrier, 4 other warships, and 6 merchant ships.

LOSSES.

Warship losses reported during March were :—

British—Corvettes Bluebell and Vervain. R.C.N. Corvette Trentonian.

United States—Submarine Barbel.

Losses sustained by the Anchor Line were also made known, and included the 17,000-ton Caledonia (re-named Scotstoun) and Transylvania —both commissioned as armed merchant cruisers and sunk on June 13, 1940, and August 10, 1940, respectively; the 9,000-ton Britannia—sunk on March 25, 1941, by an enemy raider which made no attempt to pick up survivors; and the 7,000-ton Elysia—sunk on June 5, 1942, by Japanese raiders in the Indian Ocean. It was also mentioned that during the North Africa operations, the Cameronia had fought off heavy enemy air raids on December 21–22, and though torpedoed, reached port.

APRIL.

Most of the remaining ships of the German navy, having ceased to take an effective part in the war, came to an inglorious end by being bombed to destruction in harbour during the month of April. It was announced on April 9, that after a night raid by nearly six hundred aircraft of Bomber Command, reconnaissance had shown that the Admiral Scheer, which had arrived at Kiel from Gdynia only two days before, had been hit and sunk, and was lying almost completely upside down in the inner dock basin; also that the heavy cruiser Admiral Hipper and the cruiser Emden were " possibly damaged " (they were later found stranded at Kiel, probably to prevent sinking). On April 16, after an attack on Swinemünde by a small force of Lancasters using 12,000-lb. bombs, reconnaissance showed that Germany's last remaining armoured ship—the " pocket battleship " Lützow (formerly the Deutschland)—had been sunk, and was lying in shallow water with her stern on the bottom. On April 21, it was officially stated that the 26,000-ton battle cruiser Gneisenau, which after being badly damaged by bombing had been taken to Gdynia, had fallen into Russian hands when they entered the enemy's Baltic ports. It would appear that she was being dismantled, as she had been stripped of her main armament. At the same port was the uncompleted 10,000-ton cruiser Seydlitz.

The whole of Germany's seven capital ships were now accounted for. Of these, four had met their end as the result of air attack—the Lützow, Admiral Scheer, Tirpitz, and Gneisnau; and the remaining three as the result of naval action—the Graf Spee, Bismarck, and Scharnhorst. In fact, only two German warships of appreciable size—the 8-inch gun cruiser Prinz Eugen and the 6-inch gun cruiser Nürnberg—remained effective.

After some days of fighting through blocked streets, the dockyard area of Bremen was occupied by British naval parties and the King's Own Scottish Borderers at dawn on April 27. Sixteen U-boats of the largest type—all but one of them ready for launching—and a large Narvik-class destroyer, nearly completed, were captured. One of the submarines bore the number U-1217. Although the local shipbuilding yards were designed to produce these large under-water craft, the machine shops and foundries had been so damaged by bombs that the port was only being used for the assembly of U-boats, the parts of which were manufactured inland. The harbour was found to be practically empty except for the wrecks of a few coasters and of another Narvik-class destroyer sunk by the R.A.F. a year before.

North-east of Bremen, the Guards Armoured Division, as they advanced, liberated many hundred British naval and Merchant Navy officers and men from two large prison camps—Marlag and Milag.

In the late afternoon of April 9, Bomber Command attacked U-boat shelters and oil-storage depots in Hamburg with 22,000-lb. and 12,000-lb. bombs. This was followed by a night raid by some six hundred aircraft of Bomber Command on yards at Kiel where prefabricated U-boats were being assembled.

Six assault landing craft supported the British 49th (West Riding) Division when the latter crossed the Ijssel where it flows into the Rhine just east of Arnhem. According to the report published on April 13, this attack was launched at 11.30 p.m., after a 3½-hour bombardment, the enemy was taken by surprise, and by nightfall of the following day half Arnhem was in British hands.

In a joint statement by the Admiralty and 8th U.S.A.A.F. headquarters on April 21, it was announced that a rocket bomb " which travels faster than sound and explodes after deep penetration " was being used by the Allies and that it was invented by Captain Edward Terrell, R.N.V.R. The first attacks with it were made against the E-boat pens at Ijmuiden on February 10 and March 14, when several of these bombs pierced the massive concrete roofs of the pens and were believed to have caused considerable damage inside. Their striking velocity, it was stated, is 1,100 f.s.

The British submarine Seraph—which had landed General Mark Clark, U.S. Army, and a party of American officers for their secret meeting with French leaders on the Algerian coast before the landing in North Africa—on April 9 was manœuvring for an attack on a U-boat which was also diving, when she collided with the latter at a depth of 60 feet. The Seraph suffered only light injuries and returned safely to her base.

On April 18, General Eisenhower—as Supreme Commander—issued a notice to German merchant seamen in which he said that every available German ship would be required after the war to bring in supplies and maintain essential traffic. He asked them to prevent the scuttling or removal of ships planned by fanatics, and told them that after the Allied occupation of the ports, masters and seamen would cease to be members of the *Wehrmacht*, would have their wages and other benefits maintained, and be allowed to create their own trade unions. He warned them that no Allied shipping would be available for German needs.

In a statement giving the total casualties to all ranks of the British Commonwealth and Empire forces from September 3, 1939, to February 28, 1945, issued by Mr. Churchill on April 10, it was also mentioned that Merchant seamen losses amounted to 30,179 deaths (including those presumed in missing ships) and 3,982 internees. The figures included nationals of the Dominions, India, and the Colonies serving in British registered ships, but excluded deaths of nationals of the United Kingdom serving in ships registered outside the U.K.

The Netherlands government announced on April 14, that Dutch shipping losses from September 1939 to March 1945 totalled 1,500,000 tons. At the outbreak of war the Dutch merchant fleet consisted of 1,191 vessels, totalling 2,912,038 tons. Half the fleet had been chartered to the Ministry of War Transport.

Early in the month it was reported that the Germans had taken to using barrage balloons, flown from escorting warships to protect convoys off the Norwegian coast from Allied air attacks.

The German North Sea Naval Station administrative headquarters were reported, on April 22, to have surrendered to tanks of the 11th Hussars. Paymaster Rear-Admiral Siegfried Engel and his staff were made prisoners.

On April 15, the Admiralty announced that, with the approval of the Australian Government, Vice-Admiral Sir Louis Hamilton had been lent to Australia as First Naval Member of the Commonwealth Navy Board in succession to Admiral Sir Guy Royle ; also that Vice-Admiral Sir Frederick Dalrymple-Hamilton had been appointed Vice-Admiral Malta and Flag Officer, Central Mediterranean, in succession to Sir Louis.

ARCTIC.

The Finnish Defence Ministry announced that the last German troops had been expelled from Finland on April 27, and that the Arctic war had ended.

HOME WATERS.

An Admiralty report, on April 1, made known that naval aircraft, flown from carriers under the command of Rear-Admiral McGrigor, flying his flag in the escort-carrier Searcher, had made a series of raids in unfavourable weather against enemy shore installations and shipping on the Norwegian coast. Other ships taking part in these operations were the escort-carriers Queen, Puncher, and Nairana. An enemy escort vessel and tanker in Aalesund Harbour were hit, A.A. batteries were silenced, installations on Vikerö Island were severely damaged, and three Me. 109's were shot down.

Shortly afterwards, Mosquitos of the Coastal Command attacked enemy shipping at anchor in Sandefjord. A tanker in dry dock was hit by over thirty rockets and blew up with such violence that both ship and dock were destroyed.

On April 4, the Admiralty announced that a destroyer force under Captain H. W. S. Browning, R.N., in H.M.S. Onslow, with H.M.S. Zealous and Zest, and H.M.C.S. Iroquois in company, had intercepted an enemy convoy of four supply ships and three frigate-type escorts off Jösing Fjord (Norway) in the early morning. One supply ship was torpedoed and sunk ; a second was left in flames ; a third was probably hit by a torpedo ; and one escort ship was severely damaged by gunfire. The British ships suffered no casualties and only superficial damage.

What was described in a joint Admiralty and Air Ministry *communiqué* as " one of the fiercest and closest fought battles yet carried out by light coastal forces of the Royal Navy " took place when strong forces of E-boats were intercepted while attempting to approach the Allied convoy routes between the East Coast and liberated ports in Belgium and Holland. On the nights of April 7 and 8, aircraft of Coastal Command intercepted the enemy, who was hotly engaged and driven off by British warship patrols. At least three E-boats were sunk and five severely damaged against a British loss of two M.T.B.s. In one encounter a M.T.B. sank after being rammed by the leading E-boat, while the second E-boat in the line was rammed, raked with gunfire, and sunk by another M.T.B. On April 25, the Admiralty made known that H.M. South African frigate Natal had recently sunk a U-boat in the North Sea by depth charges.

ATLANTIC.

On April 15 Allied naval forces, under the command of the French Rear-Admiral Rue and comprising the French battleship Lorraine, the cruiser Duquesne, the destroyers Fortune, Basque, and L'Alcyon, a French destroyer escort, two French frigates, and nine French, one British, and five Canadian minesweepers, bombarded enemy fortifications at Royan and the Pointe de Graves (Le Verdon) on both sides of the Gironde estuary. At the same time 1,300 unescorted U.S.A.A.F. Fortresses and Liberators dropped 460,000 gallons of liquid fire, 1,000 H.E. bombs, and 6,000 incendiaries on German positions. French troops then went in to attack on both sides of the estuary. This was the beginning of a combined operation aimed at freeing the port of Bordeaux, which in an order of the day before the assault General de Larminat described as being " indispensable for our imports, so that the French will have enough to eat next year." Resistance finally ceased on April 21, and the sea-way into Bordeaux was opened.

On April 3, it was made known that the frigate H.M.C.S. Annan had sunk a U-boat in the Atlantic, a number of survivors being made prisoners of war. At the end of the month it was announced that, while recently escorting a convoy in the North Atlantic, H.M. minesweepers Pincher and Recruit had sunk a U-boat by gunfire, picking up some survivors.

MEDITERRANEAN.

Allied destroyers were particularly active in Italian waters during the month, chiefly in bombarding shore targets. Their operations, as officially reported, can be most conveniently recorded in diary form :—

April 1, U.S. destroyer Mackenzie, in support of the Army, fired on enemy storehouses, transport, and personnel near the Franco-Italian frontier.

April 3, the French destroyer Tempête engaged batteries and bombarded a radio station in the same area.

April 4, the French destroyer Trombe fired on enemy storehouse and positions.

April 5, the British destroyer Musketeer engaged an enemy battery.

April 8, the British destroyers Milne and Lookout, in support of the 5th Army, bombarded enemy batteries and troop concentrations " with great success."

April 9, the 5th Army, supported by the fire of the Marne and Lookout, made further progress in the Ligurian coastal area.

April 11, successful bombardments by British and French destroyers Musketeer and Trombe of targets on Franco-Italian frontier.

April 12, the cruiser, H.M.S. Orion, bombarded San Remo Harbour.

April 15–16, a French submarine chaser sank an enemy explosive boat at night.

April 17, the Trombe sank an E-boat off Porto Maurizio (Gulf of Genoa). The same night British M.T.B.s and Yugoslav light coastal craft sank several R-boats, F-lighters, and small craft off the Gulf of Venice and Trieste.

Soon after this the German front in Italy rapidly crumbled, and on April 24, the 5th Army captured the naval base of Spezia. On April 27, the port of Genoa was entered without opposition and taken over by an Allied naval party. Many of the jetties and cranes were found to be undamaged, although the inner harbour and sea approaches were heavily mined. The Orion and Trombe supported with their gunfire French troops which had crossed the Maritime Alps on a broad front and continued their advance along the Italian Riviera.

On April 29, the Italian campaign ended with the unconditional surrender of all German and Italian-Fascist forces in Northern Italy and Western Austria (over a million in number). Mussolini, with twelve members of his Cabinet, had been executed by Italian partisans on the previous day.

INDIAN OCEAN.

British Eastern Fleet Headquarters announced on April 14, that British destroyers, in an intensive sweep along 375 miles of the South Burma Coast, had come to within 30 miles of the Irrawaddy delta in search of Japanese ships moving up the coast by night towards the Irrawaddy. The destroyers threaded their way by day and night among hundreds of islands through narrow and shallow channels, searched river mouths, and sank several enemy ships, suffering themselves neither damage nor casualties and seeing no Japanese aircraft or warships. The Irrawaddy delta, it was stated, was blockaded by air and sea, thus depriving the enemy of an important line of communication.

On April 20, SEAC announced that during the past week units of the East Indies Fleet, including a French battleship, under Vice-Admiral Harold Walker, had made a number of attacks on enemy-occupied ports in Sumatra, during which Sabang was bombarded by battleships and cruisers ; Kota Raja bombarded by destroyers ; Padang and Emmahaven bombed by naval aircraft ; and six small supply vessels sunk. The Japanese made a number of air attacks against the naval force, but they were repulsed by fighters which shot down three enemy aircraft.

It was made known on April 30, that battleships, cruisers, and destroyers of the East Indies Fleet had bombarded airfields on Car-Nicobar ; these were also attacked by carrier-borne aircraft. Later on the same day, similar attacks were made on installations at Port Blair, Andaman Islands. Satisfactory results were reported.

FAR EAST AND PACIFIC.

A special *communiqué* from Fleet Admiral Nimitz, issued on April 1, made known that a great combined operation had resulted in a successful landing on the west coast of the island of Okinawa, in the Ryukyus. This, it was stated, was the largest amphibious operation of the Pacific War up to date. Over 1,400 ships took part, and the American troops had gone ashore, after a " heavy air bombing and a crushing bombardment from battleships, cruisers, and other naval units," under cover of an air umbrella of 1,500 naval aircraft. Without the loss of a single man, they advanced two miles inland to capture the airfields of Yontan and Kadena. The operations were under the supreme tactical command of Admiral R. A. Spruance, U.S.N. The left flank was covered by a powerful British force under Vice-Admiral Sir Bernard Rawlings.

In spite of this propitious start, considerable enemy opposition materialised before long. On April 6 and 7, strong counter-attacks were made against the U.S. naval forces, and on the afternoon and evening of the first day a large force of Japanese aircraft, pressing their attack with desperation, succeeded in sinking three American destroyers and damaging several other destroyers and smaller craft ; no large ships were hit. In all, 245 enemy aircraft were destroyed by U.S. naval aircraft on that day. On April 18, three-quarters of the island was reported to be in American hands.

Early on April 7, naval reconnaissance aircraft sighted an enemy surface force passing south of Kyushu and heading into the East China Sea. This included the new 45,000-ton, 16-inch gun battleship Yamato—the most powerful warship left of the Japanese navy, a light cruiser of the Agamo class, another small light cruiser or large destroyer, and a number of destroyers. A fast cruiser task force under Vice-Admiral Mitscher made for the enemy fleet at high speed and brought it under air attack by the middle of the day. No air opposition was encountered, but there was heavy A.A. fire from the Japanese ships. The Yamato was hit by at least three torpedoes and eight heavy bombs and sank ; the Agamo class cruiser and three destroyers were also sunk ; and three other destroyers were left burning ; only about three destroyers escaped. Only one ship of the U.S. force suffered minor damage, and seven naval aircraft were lost.

In minor actions on April 7, U.S. carrier aircraft shot down thirty enemy aircraft. In all engagements during the two days, the Japanese lost 417 aircraft, mostly in the Okinawa area.

Admiral Nimitz subsequently made known that, in addition to appreciable casualties sustained by the American troops, the U.S. Pacific Fleet, up to April 18, had lost 989 killed, 2,220 had been wounded, and 260 missing, during the Okinawa operations.

The British Pacific Fleet in action against the Sakishima group on April 1, was twice unsuccessfully attacked by enemy air formations which lost several aircraft ; in addition, naval aircraft destroyed or severely damaged twenty aircraft flown in from Formosa on the previous night. On April 6 and 7, British carrier-borne aircraft attacked the airfields and other installations on Ishigaki and Miyako of the Sakishima group ; in the course of these operations five enemy aircraft were destroyed in the air and three on the ground. These airfields were the targets for further carrier aircraft attacks, made by the U.S. Pacific Fleet later in the month.

On April 13, it was announced that carrier aircraft of the British Pacific Fleet had for the first time attacked Formosa, strafing and bombing airfields and installations at Matsuyama and Shinchiku without opposition, damaging a number of aircraft on the ground, hangars, barracks, a railway bridge and other targets. According to Tokyo radio, the aircraft carriers engaged in these operations were the Victorious, Illustrious, Indomitable, and Indefatigable.

While the British warships were lying off Formosa, unsuccessful attempts were made to attack them by several small groups of Japanese aircraft, probably including " suicide pilots "—*Kamikaze*. Remarking on the latter in a special announcement, Admiral Nimitz said that the *Kamikaze* corps, which first began to operate during the Philippine sea battle in October 1944, try to crash their aircraft on the decks of the Allied ships ; that some ships of the U.S. fleet had been damaged by these tactics, but no battleship, fast carrier, or cruiser had been sunk by them. With one exception, *Kamikaze* pilots who had attempted to crash on British ships had missed their mark. The eventual use of suicide aircraft by the Japanese, he said, had long been anticipated, and many had been shot down. The suicide technique had also been employed in other ways, e.g. by suicide swimmers and human torpedoes; though most of these attacks had completely failed. That this was all part of a policy of desperation was shown by the fact that Admiral Toyoda had just broadcast an exhortation to the Japanese navy to become a "suicide corps" because Japan was facing "the moment when the rise or fall of the nation will be decided." The naval force led by the battleship Yamato was, he said, a "suicide force"—and so it proved. The lengths to which these fanatics would go was shown when, on April 28, one of them deliberately crashed his aircraft into the U.S. hospital ship Comfort while evacuating wounded from Okinawa; the ship was severely damaged, twenty-nine of the patients, passengers, and crew killed, and thirty-three seriously wounded.

In a *communiqué* issued on April 21, Admiral Nimitz stated that during the Okinawa operations and associated attacks between March 18 and April 18, 15 U.S. ships had been lost—5 destroyers, 1 destroyer transport, 2 minelayers, 1 gunboat, 4 landing craft, and 2 ammunition ships; during the same period, the Japanese had lost 1 battleship, 2 light cruisers, 5 destroyers, 5 destroyer-escorts, 28 small cargo ships, many torpedo-boats and small craft, and 2,569 aircraft.

With the Allied forces closing in on the central target—Japan, it became necessary to clarify the commands and responsibilities of Fleet Admiral Nimitz and General of the Army MacArthur, and on April 5, it was announced from Washington that in future the former would be in charge of all naval units and the latter of all army units in the Pacific war area on terms of equality; the existing separate commands having been abolished, all army troops hitherto under Admiral Nimitz would come under General MacArthur, and control of the U.S. 7th Fleet, hitherto under General MacArthur's command, would become vested in Admiral Nimitz.

LOSSES.

The names of lost warships reported during April were :—

British—The sloop, H.M.S. Lapwing.

United States—The submarine Scamp.

MAY.

A swift succession of dramatic events in the opening days of May led up to the complete defeat of Germany and the end of the war in Europe. On May 2, the British 2nd Army reached the Baltic and the 6th Airborne Division entered the Baltic port of Nismar (Mecklenburg). That evening Lübeck was captured by a British armoured division. Berlin fell to the Russians. On the following day, Hamburg—the largest port in continental Europe—surrendered to the British 2nd Army. Here, in spite of the heavy bomb damage inflicted on the shipyards, many of the reinforced concrete machine shops used to service and assemble U-boats, E-boats, and R-boats were found to be undamaged and a very large number of prefabricated U-boats were in various stages of completion. On May 7, it was announced from 21st Army Group headquarters that the cruisers Prinz Eugen and Nürnberg, with 160,000 tons of merchant shipping, had been surrendered to the British troops which had entered Copenhagen and other Danish harbours.

It was on May 7, too, that General Jodl, representing both the German High Command and Grand-Admiral Dönitz, the self-designated Head of the German State, signed an act of unconditional surrender of all German land, sea, and air forces. This was ratified and confirmed in Berlin soon after midnight on May 8–9.

Grand-Admiral Dönitz had proclaimed himself *Führer* on the evening of May 1, after it had been announced on the Hamburg radio that Hitler had " fallen at his command post in the Reich Chancellery "—it was afterwards found that he had committed suicide. Dönitz and his staff were all arrested by the British authorities on May 23.

The following historic Order for the surrender of the German Fleet was issued by the Admiralty on May 8 :—

(1) All German and German controlled warships, auxiliary vessels, merchantmen, and other craft are to report their positions to the nearest Allied radio-telegraphy station, who will give them orders to proceed to such Allied ports as directed.

(2) All warships, etc., at present in harbour are to remain so until further notice.

(3) U-boats at sea are to surface, fly a black flag or pennant, report to the nearest Allied radio-telegraph station, and proceed on the surface to such ports as directed.

(4) All breech blocks are to be removed from guns of warships at sea, and all torpedo tubes unloaded.

(5) In harbour, all ammunition, explosives, warheads, etc., are to be landed.

(6) Minesweepers and salvage vessels are to be held ready for such duties as may be directed.

(7) Boom defences at ports and harbours are to be kept open, and demolition charges and minefields rendered ineffective.

(8) All personnel are to remain on board ship or in their establishments until further notice.

On May 9, a British squadron, under the command of Captain Herbert Williams, R.N., headed by the cruiser H.M.S. Birmingham and followed by H.M.S. Dido and H.M. destroyers Zealous, Zephyr, Zest, and Zodiac anchored in Copenhagen to receive the formal surrender of the remnants of the German fleet there. Vice-Admiral R. Vesey-Holt had been appointed Flag Officer, Denmark, in the rank of Rear-Admiral. The enemy warships, none of which was flying the German flag, surrendered without opposition at 9 a.m. They included the 10,000-ton cruiser Prinz Eugen, the 6,000-ton cruiser Nürnberg, the 5,000-ton cruiser Emden, 3 destroyers, 2 torpedo-boats, 10 minesweepers, 13 *flak* ships, 19 armed trawlers, and 2 armed merchantmen. British Marines who landed were given a wildly enthusiastic reception by great crowds of Danes on the waterfront. Later in the month the two larger cruisers were moved under British naval escort to Wilhelmshaven.

Another notable event on May 9 was the surrender of the Channel Islands, signed in the wardroom of H.M. destroyer Bulldog. This was not effected without some trouble, an arrogant young German naval officer, who had gone on board the previous night to receive the terms of surrender, having ordered the British warships to " move away from these shores," and if they did not it would be regarded as a " provocative act." He was sternly ordered to withdraw, and a German General returned next morning to comply with the terms A token force of Royal Artillery was landed to hoist the Union Jack at St. Peter Port where they were received with frantic enthusiasm by the Channel Islanders freed after five years of enemy occupation.

Rear-Admiral Brüning, commanding German naval forces—E-boats, R-boats, etc.—operating from Dutch bases, arrived on board an E-boat from Rotterdam at Felixstowe, on May 13. There he signed the unconditional surrender of all vessels under his command.

The first German submarine to surrender to the Navy—U-249, surfaced off the Lizard on May 9. She was escorted into Portland by two sloops, and on May 10, with the White Ensign flying over the German flag, she was surrendered unconditionally by her commanding officer—Oberleutnant Kock to Rear-Admiral R. J. R. Scott. Her crew of 5 officers and 47 men were taken prisoners. Later the same day two more U-boats surrendered at Loch Eriboll—North Scotland. From then, U-boats surrendered daily in considerable numbers, reporting to Allied ports at home and abroad. On May 14 Admiral Sir Max Horton, C.-in-C. Western Approaches, when receiving the surrender of 8 U-boats at Londonderry, said that between 50 and 70 were known to have been at sea at the time of Germany's capitulation; of these about 35 had been accounted for on both sides of the Atlantic and some might not have received the surrender instructions. At the same time it was announced that about a hundred U-boats had been found on the French Atlantic seaboard and in Norway.

When U-532 surrendered at Liverpool she was found to be carrying a cargo of 110 tons of pure tin, used as a false keel, also quantities of rubber, wolfram, molybdenum, and quinine. A large German submarine (1,600 tons)—U-234, making for Japan with three *Luftwaffe* generals, two Japanese officers, and carrying aviation plans, charts, and equipment, surrendered to the U.S. Navy in the Atlantic on May 13. One of the *Luftwaffe* officers was Major-General Kessler who had commanded the German air forces operating over the Atlantic. The Japanese officers committed *hara-kiri*. The commander and second-in-command of U-963, which was scuttled off the Portuguese Coast, were handed over to the British authorities and taken to England. London had a visit by a U-boat when, on May 21, U-776 with a British crew arrived from Portland and was moored off the Embankment.

In the final stages of hostilities before the surrender, long-range Liberators of Coastal Command engaged in the greatest anti-submarine hunt of the war and sank four or five U-boats in twenty-four hours, several attacks being made on surfaced submarines which fought back bitterly.

The German minesweeper M-607 arrived in the Firth of Forth on May 14, having a number of German naval officers on board. They brought information about enemy minefields in the Skagerrak and Kattegat.

A statement on conditions in German ports was published by SHAEF on May 15. Amongst the particulars given were the following:—

Bremen—berths available for 8 liberty ships; 16 prefabricated U-boats on the stocks; 9 others completed, but sabotaged.

Bremerhaven and Wesermunde—berths for 20 liberty ships; the 46,000-ton liner Europa in fair condition, but the sister-ship Bremen a total loss.

Cuxhaven—all installations and ships intact.

Brunsbüttel—port undamaged.

Hamburg—some deep-water berths clear; 50 merchant ships and 19 floating docks sunk.

Heligoland—the town completely destroyed and empty of civilians.

Wilhelmshaven—berths in good condition except for bomb damage; all U-boats scuttled.

Kiel—all shipyards devastated; 12 U-boats scuttled.

The following day, the Admiralty gave details of the fate of the remainder of the larger ships of the German navy. Besides the warships surrendered at Copenhagen, the following were accounted for:—

Battle cruiser Gneisenau and the old battleship Schleswig-Holstein scuttled as blockships at Gdynia.

Pocket battleship Lützow lying on the bottom and the old battleship Schlesien sunk at Swinemüde.

Cruisers Admiral Hipper and Emden scuttled and burnt out at Kiel; Köln lying on the bottom at Wilhemshaven; Leipzig, damaged at Aabenraa; Seydlitz, blown up at Königsberg.

Aircraft carrier Graf Zeppelin, uncompleted and damaged, at Stettin.

The appointment of British Flag Officers to commands in Germany were announced on May 15. They were:—

Kiel—Vice-Admiral H. T. Baillie-Grohman.

Wilhemshaven—Rear-Admiral G. C. Muirhead Gould.

Hamburg—Rear-Admiral H. T. England (as Commodore-in-Charge).

In addition, Admiral Sir Gerald Dickens became Flag Officer, Holland; Vice-Admiral R. V. Holt, Flag Officer, Denmark; and Rear-Admiral F. E. Hutton, Flag Officer, Belgium. On May 20, it was announced that Vice-Admiral Ghormley, U.S.N., had been appointed commander of U.S. Naval Forces, Germany, with Rear-Admiral A. G. Robinson, U.S.N., as commander of U.S. ports and bases in Germany, including Bremen.

The elimination of the U-boat menace was the first step in the return to peace-time conditions at sea. The next step—the clearance of all mines—was bound to take much longer, but on May 18 the Admiralty were able to announce that the central area of the North Sea—about 20,000 square miles, including the Dogger Bank—was again open to fishing, and that there were two approach channels, swept and buoyed, one off Montrose and the other from the Humber.

Another symptom of peace was the gradual release of information about certain weapons and devices which had hitherto been on the secret list, at least as regards details. One of these was the Double Longitudinal (L.L.) sweep. This was the first completely successful method of dealing with the magnetic mine, which the Germans had started to use soon after the outbreak of war. It comprised two long " tails " of self-buoyant electric cables each towed by a minesweeper. A current, generated by batteries in the ships, passed through the cables and entered the sea as a large " surge." By this means ten or more acres of the sea bottom could be subjected to a magnetic field of such strength and duration that all mines within it were exploded. The ships towing the sweep steamed on parallel courses and made a succession of the " surges," thereby making a safe channel.

Information was also given about enemy devices. In their vain attempt to interrupt the flow of supplies to the Allied forces on the Continent, the Germans made extensive use of midget U-boats, and while the war was still on no less than 81 of these were sunk or captured, 28 more possibly sunk, and attacks carried out on 70 others; a further 100 were captured after Germany's capitulation. There were three types of these "midgets"—the *Biber* (Beaver), the *Molch* (Salamander), and the *Seehund* (Seal). The *Biber* was a one-man craft, 29 feet 6 inches long and displacing about 6 tons; it carried two electric torpedoes slung outboard, one on either side. It had a speed of 6½ knots on the surface and 6 knots submerged. The maximum fuel endurance on the surface was about 100 miles; but the human endurance did not average more than 48 hours. The *Molch* was also a one-man U-boat, 46 feet long, having a maximum speed of 6–7 knots, and with a similar armament to the *Biber*. Its endurance was at least 24 hours. The *Seehund* was a two-man craft, 39 feet long and displacing 16 tons. It carried two electric torpedoes, and had an estimated endurance of 275 miles at 8 knots on the surface, plus 50 miles at 3 knots submerged.

The remarkable success of a two-man Italian "midget" submarine in penetrating the harbour defences of Alexandria, fixing explosive underwater charges and blowing holes in the bottoms of the battleships Queen Elizabeth and Valiant, was made known during this month (the incident occurred in December, 1941). Both ships settled on the mud, but H.M.S. Valiant was repaired sufficiently to enable her to proceed under her own power to dry dock, and H.M.S. Queen Elizabeth was also patched locally, taken through the Suez Canal, thence she made her way under her own steam to an American port for repair.

On the break up of the Coalition Government, a list of Members of Mr. Churchill's new Cabinet was issued on May 25; in this the First Lord of the Admiralty was Mr. Brendan Bracken.

A notable promotion, announced on May 9, was that of Admiral Sir James Somerville to be Admiral of the Fleet.

The fine achievement of the British liners Queen Mary and Queen Elizabeth in transporting over a million soldiers (80 per cent. Americans) to Europe, was made known by SHAEF; it was also stated that each ship could carry a full division, the Queen Elizabeth even more. Their immunity from U-boat and air attacks must be attributed primarily to their speed, which not only made them a more difficult target but also gave wider scope for routeing.

HOME WATERS.

The last operation of the war carried out by the Home Fleet was an offensive sweep off the Norwegian Coast near Narvik, some details of which were made known by the Admiralty on May 4. A strong force of Avenger and Wildcat aircraft, flown from the escort-carriers Queen, Searcher, and Trumpeter blew up a submarine depot ship, sank a U-boat alongside, and an enemy tanker, and damaged an A.A. vessel, for the loss of two aircraft. H.M. ships, which suffered no damage, were under the command of Vice-Admiral McGrigor flying his flag in H.M.S. Norfolk. In company were another cruiser, H.M.S. Diadem, and the destroyers Carysfort, Opportune, Savage, Scourge, and Zambesi.

MEDITERRANEAN.

The British destroyers Kimberley and Catterick, and the Greek destroyer Krete, on the night of May 1, landed Greek troops on Rhodes and the small island of Aliminia. In a fierce fight, 30 Germans were killed and 40 prisoners taken. Three enemy gun batteries were knocked out, jetties and stores set on fire, and installations destroyed.

Allied Mediterranean Headquarters announced on May 7 that good progress was being made in clearing the port of Genoa, where 12 berths had been made available for shipping ; that 23 enemy naval craft had surrendered at Ancona, including a small submarine, 7 E-boats, and 5 F-lighters ; and that enemy naval prisoners numbered over 1,300.

On May 11, it was made known by the same authority that all German forces in the Dodecanese and Ægean—some 20,000—had surrendered unconditionally, including the garrisons of Crete, Rhodes, Leros, Milos, and Cos ; and Allied troops had been landed in those islands on May 9, by British warships, without incident.

INDIAN OCEAN.

A special *communiqué* by SEAC on May 2 announced that, in the largest amphibious combined operation yet undertaken in South-East Asia, British and Indian troops had landed at dawn on both banks of the river, at points 25 miles south-east of Rangoon. The invasion fleet, escorted by battleships, carriers, and destroyers left its Arakan base on April 29, and steamed 400 miles down the Burma coast. Neutralising attacks by the East Indies Fleet were made on the Andamans and Nicobars during this period. The day before the landing, hundreds of Indian parachute troops were dropped at Elephant Point—a large promontory on the west bank of the Rangoon river, where they mopped up all Japanese gun positions in the area. The landings, which were preceded by very heavy air attacks, met with no opposition. An Order of the Day, issued by Admiral Mountbatten, stated that the occupation of Rangoon by this successful combined operation was the culmination of a long series of concerted operations by the forces of his command. They had been carried out with such speed that the Japanese had been outpaced and the port had been seized before its installations could be destroyed. The inner harbour, said the Order, would be open to shipping in a very few days.

The fall of Rangoon virtually ended the Burma campaign, as all the Japanese troops west of the Irrawaddy were trapped, while those east of the river would have to fight their way into Siam over wild jungle country. With Rangoon once again in Allied hands, the flow of seaborne supplies to China would be greatly expedited. It was particularly satisfactory that all this should have been accomplished just before the monsoon was due to break. H.M. the King sent a special message of congratulation to Admiral Mountbatten on the liberation of Rangoon.

On May 16, naval aircraft operating from the escort-carrier H.M.S. Shah of the East Indies Fleet, sighted and attacked in daylight a 10,000-ton Japanese cruiser of the Nati class, in the North Malacca Straits. One probable bomb hit was observed. Meanwhile a British destroyer force led by Captain M. L. Power, R.N., in the Saumarez, with the Venus, Verulam, Virago, and Vigilant, proceeded at speed to intercept the enemy. Contact was made at night about 50 miles W.S.W. of Penang, and the cruiser was sunk by torpedo attacks. H.M.S. Saumarez sustained a small number of casualties, but no other ship was hit. The Saumarez and Virago had previously distinguished themselves by taking an active part in the sinking of the Scharnhorst.

FAR EAST AND PACIFIC.

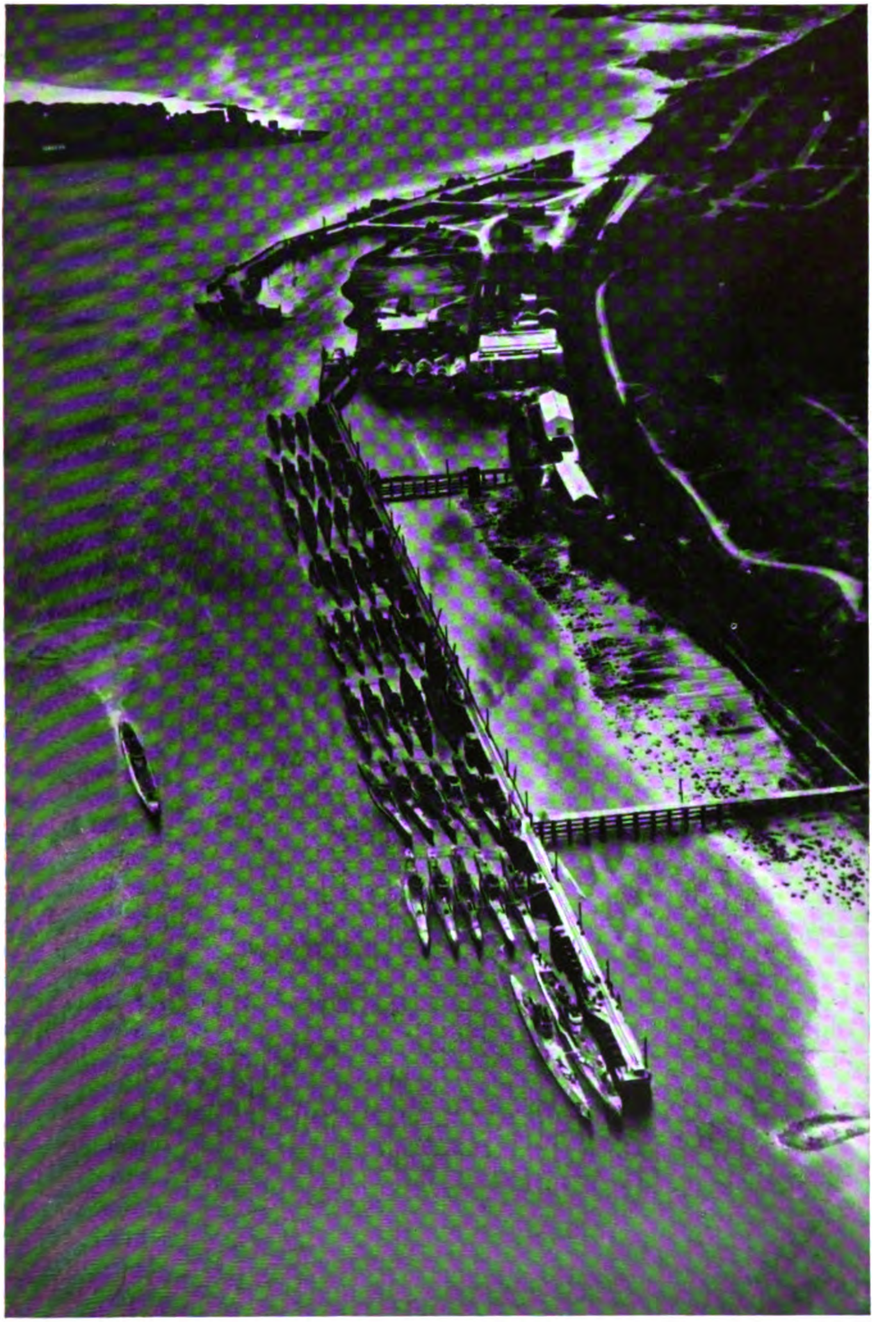
Very heavy fighting continued on and around Okinawa, and the Japanese tried desperately to stem an assault on May 11 by two American infantry and two Marine divisions, powerfully supported by naval guns, carrier aircraft, and artillery. During May 11–12, over 125 Japanese aircraft were destroyed; a single U.S. destroyer accounting for 19. A large Allied warship and three light naval craft were reported to have been damaged. Throughout the month naval gunfire and aircraft assisted in the slow but steady advance against bitter resistance.

At the same time, the British Pacific Fleet kept up the attacks on the Sakishimas, bombing airfields, barracks, port installations and buildings. U.S. naval aircraft made widespread assaults on places still in enemy hands, including the Palaus, Carolines, Bonins, and Marshalls. Admiral Nimitz reported on May 25 that during the previous night and throughout the day Japanese aircraft had made desperate bombing, strafing and "suicide" attack on U.S. ships off Okinawa, Eleven light naval units were damaged, one seriously; 166 of the enemy had been shot down.

At 8.15 a.m. on May 1, a landing in force under the guns of Allied warships was made on Tarakan—the oil-producing island off the north-east coast of Borneo. Amongst the ships taking part were some of the Royal Australian Navy, including the cruiser Hobart, the destroyer Warramunga, and the frigates Barcoo, Burdekin, and Hawkesbury. The invasion fleet had sailed for three days and nights through enemy waters to reach the objective, but there was no interference. The 9th Australian Division went ashore in a great armada of landing craft and assault boats of all types, including amphibian tanks. Rocket-fire craft made their way close in shore and maintained a heavy fire in conjunction with the bombardment of the larger ships. During the landing a Naval Commando unit marked out beach areas, marshalled the landing craft, and generally controlled much of the beach activity. A firm foothold was at once established; guns, bulldozers, tanks, and jeeps were rushed ashore, and by nightfall the Australians had penetrated nearly two miles and were within 2,000 yards of Tarakan airfield. But enemy resistance stiffened, and by May 7 warships were still providing gunfire in support of the Australian and Dutch troops engaged. By May 18 it was reported that the Japanese remnants were hemmed into a small area in the centre of the island where they were being heavily bombarded by naval guns. The end of the month saw a break through by the Australians to the north-west coast of the island, leaving only a small force of the enemy unaccounted for.

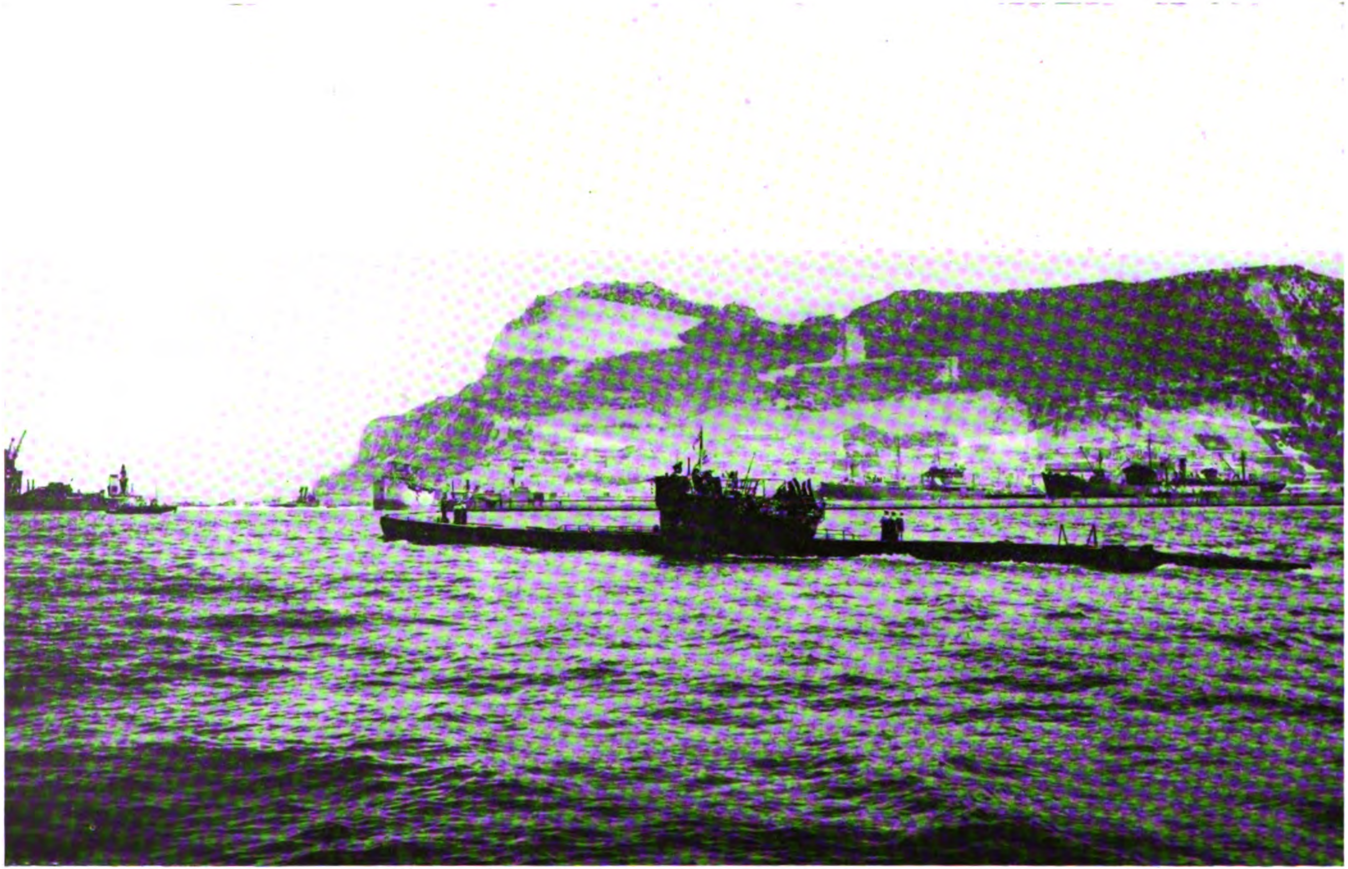
Another landing, reported on May 12, was that made by the 6th Australian Division supported by H.M.S. Newfoundland and H.M.A.S. Hobart a few miles east of Wewak in New Guinea. This resulted, after fierce fighting, in the capture of the Wewak peninsula with its airfield.

Referring to Canada's participation in the Far Eastern war, Mr. Mackenzie King mentioned that the Dominion's naval contribution included cruisers, carriers, destroyers, and frigates—about sixty ships, manned by 13,500 men. On May 28, it was stated in London and Washington that "very powerful British naval forces" were en route for the Pacific, and that British warships in that theatre, in addition to those already mentioned, included the aircraft carrier H.M.S. Indefatigable and the cruisers H.M.C.S. Uganda and H.M.N.Z.S. Gambia. It was also made known that Vice-Admiral Sir Bernard Rawlings had arrived at Guam in



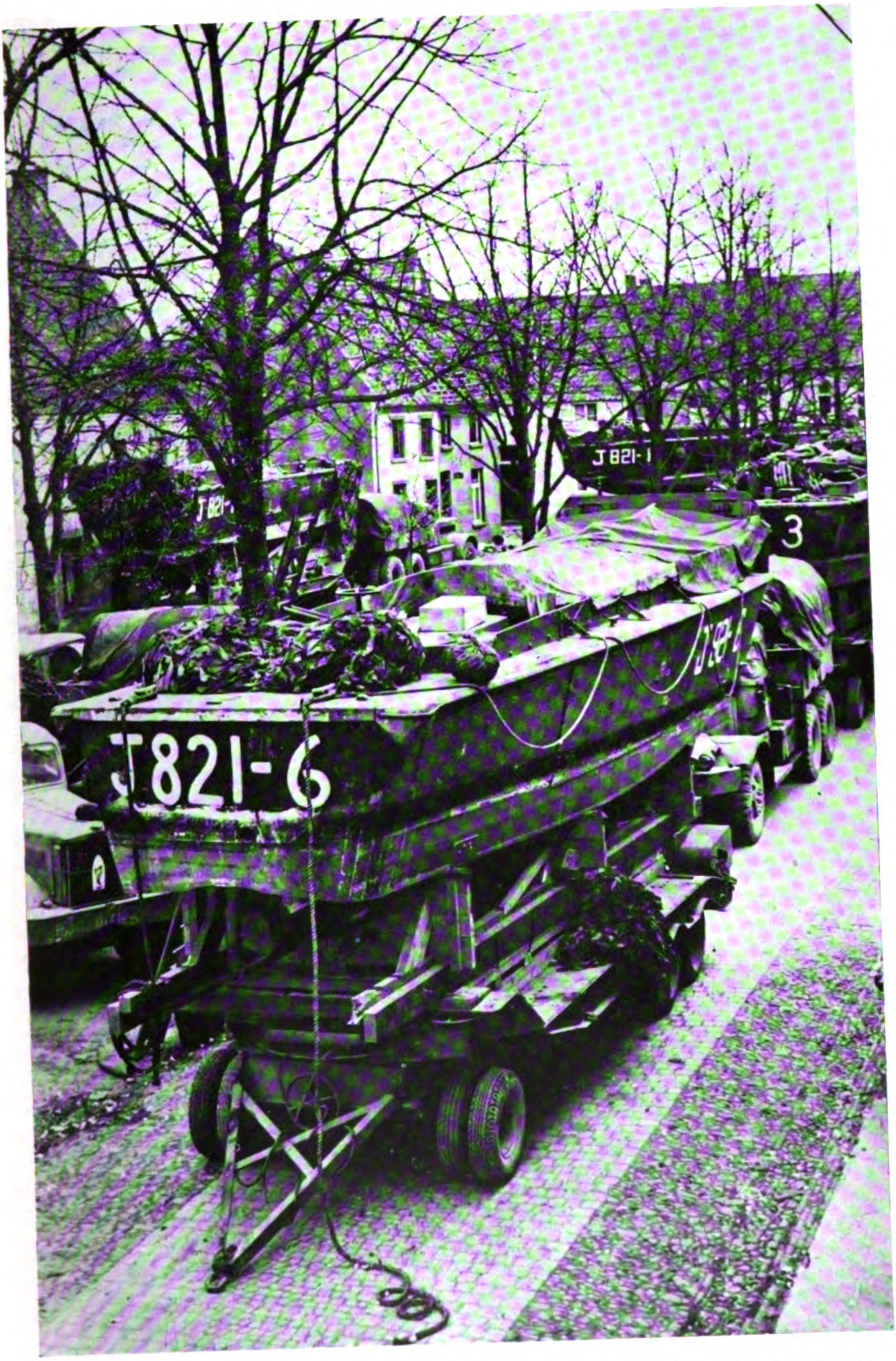
Surrendered U-boats at Lisahally.

(British official photograph. Crown copyright reserved.)



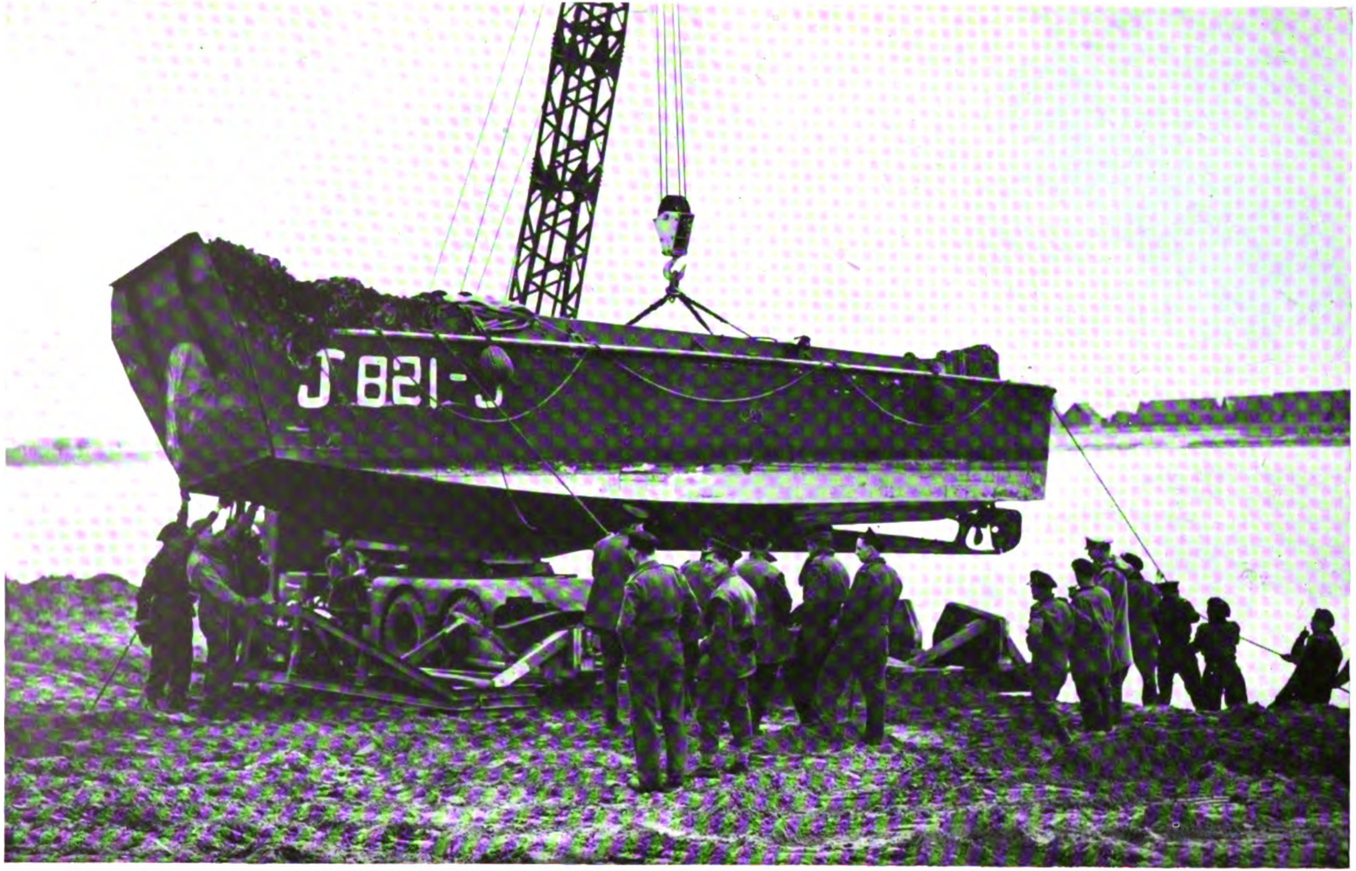
U.541 surrendering at Gibraltar.

(British official photograph. Crown copyright reserved.)



The Navy in Germany. Landing craft moving by road towards the Rhine.

(*British official photograph. Crown copyright reserved.*)



The Navy in Germany. Launching of landing craft into the Rhine.

(*British official photograph. Crown copyright reserved.*)

H.M.S. King George V for consultations with Admiral Nimitz. A further sign of the growing British naval effort in the Far East was the announcement in Australia that 5,000 skilled British workmen were arriving to help service the British Pacific Fleet, many of whom would be employed in the new Captain Cook Dock at Sydney.

LOSSES.

On the last day of the month the Admiralty published a summary of the total losses of the Allied navies (excluding the U.S. and Soviet navies) from September 3, 1939, to May 8, 1945. These were :—

Royal Navy—5 battleships, 8 aircraft carriers, 26 cruisers, 128 destroyers, 77 submarines, and 614 other vessels, the largest classes of which were 51 minesweepers and 240 trawlers—total 730.

Royal Canadian Navy—6 destroyers, 17 lesser ships.

Royal Australian Navy—3 cruisers, 4 destroyers, 6 lesser ships.

Polish Navy—1 cruiser, 3 destroyers, 1 submarine.

Free French Navy—1 destroyer, 2 submarines.

Royal Netherlands Navy—2 cruisers, 5 destroyers, 4 submarines.

Royal Norwegian Navy—3 destroyers, 1 submarine.

Royal Hellenic Navy—1 destroyer, 2 submarines.

These figures did not include losses of light coastal ships and landing craft.

The names of the following British warships lost, but hitherto withheld for security reasons, were published by the Admiralty on May 17 :—cruiser H.M.S. Curacoa ; escort-carrier H.M.S. Dasher ; destroyers Khartoum, Codrington, Cameron, Gallant, Maori, Legion, Kingston, Punjabi, Lance, and Quail ; submarines Pandora, Unity, Umpire, Vandal, P.36, P.39, P.514, and P.551 ; armed merchantmen Comorin, and Hector ; sloop Godetia ; frigate Goodall ; also 3 auxillary boarding vessels, 2 minelayers, 13 minesweepers, 61 trawlers, 31 drifters, and 29 miscellaneous craft.

The Curacoa, it was now made known, was accidentally rammed and sunk by the liner Queen Mary on October 2, 1942, about 200 miles north-west of Bloody Foreland off the coast of Donegal. The cruiser was cut in half and sank in five minutes with 338 of her ships' company. The Queen Mary had 15,000 American troops on board and, in spite of a large dent in her bows, was able to complete her passage to the Clyde at high speed. The Dasher had blown up while at anchor in the Clyde on March 27, 1943.

The names of other warship losses made known during May were :—

British—Corvette, H.M.S. Denbigh Castle. Destroyer, H.M.C.S. Skeena (wrecked off Reykjavik, Iceland, on October 25, 1944).

United States—Destroyer Little (lost off Okinawa). Submarine Albacore (lost on March 27, with a crew of 69).

JUNE.

The last joint statement on the war against the U-boats was issued under the authority of Mr. Churchill and President Truman on June 7. It was as follows :—

> " With the surrender of Germany the Battle of the Atlantic has ended ; U-boats have ceased to operate and are now proceeding under Allied orders. Beginning in September 1939, it has been a long and relentless struggle, a struggle demanding not only the utmost courage, daring, and endurance, but also the highest scientific and technical skill. Germany's object was to cut the Allied sea communications upon which the maintenance of the Allied war effort depended. This included the movements and supply of armies and air forces during

> successful campaigns in four continents. Losses have been heavy both in lives and material; at the peak in 1941 and 1942 the issue of the struggle hung in the balance. On the other hand, over 700 U-boats have been sunk and many others destroyed by the Germans themselves in the final stage. Most of these successes have been achieved by the combined Allied naval and air forces working together in the closest co-operation; others are due to mines laid from aircraft and ships; others to bombing in harbour; and a few U-boats were lost by marine dangers. But success was achieved. Thanks to the sailors, airmen, scientists, technicians, shipbuilders, and factory workers, the convoys reached their destination, and enabled the soldiers and airmen to fulfil their tasks. We, President and Prime Minister, in this our last joint statement on the U-boat war, can now report that the Allies have finished the job."

It was subsequently stated that Germany had completed 1,174 U-boats during the war, of which 785 were sunk. The 700 alluded to in the above joint statement as having been destroyed by the enemy evidently included a large number building. On June 10, the Admiralty issued an analysis of the sinking of 713 U-boats between September 3, 1939, and May 8, 1945; the figures given in it were subsequently amended, in a statement issued in March 1946, as follows:—

U.BOAT CASUALTIES.

Sunk by	*British.*	*American.*	*Total.*
Ships	208½	38½	247
Shore-based aircraft	197	48½	245½
Ship-borne aircraft	15	29	44
Ship and shore-based aircraft	24	8	32
Ship and ship-borne aircraft	7	6	13
Submarines	19	2	21
Bombing raids	21	42	63
Naval mines laid by shore-based aircraft	16	—	16
Naval mines laid by ships	16½	—	16½
Total	524	174	698
Other causes			59½
Unknown causes			23½
GRAND TOTAL			781

The U.S. Navy Department made known that from February 1942 until "VE-Day," U-boats operating in the "Gulf Sea Frontier"—comprising the Florida coastline, the entire Gulf of Mexico, and Bahaman and Cuban waters—had attacked 111 ships of which 92 were sunk with the loss of 882 men killed or wounded. Nearly all these attacks (107 ships) were made during 1942, during which year 25 ships were sunk immediately outside New Orleans and 25 more off the Florida coast between Key West and Daytona. Only 14 ships were attacked in 1943, and none subsequently. These particulars appear to relate to American vessels. Later reports give the following minimum figures for losses in this area:—

Year.	*U.S.A*	*British.*	*Other Foreign.*
1942	87	32	69
1943	14	—	6
1944	—	—	4

Mr. Churchill stated that Merchant Navy casualties from September 3, 1939, to April 30, 1945, were 30,589 fatal, 4,690 missing, 4,215 wounded, 4,088 interned—a total of 43,582. Of those missing and interned, 5,994 were still unaccounted for.

U-boats continued to surrender during the month and there was a second case of one being scuttled by her crew off the Portuguese coast.

Some idea of the contribution of the minesweeping service to the war was given by the Admiralty announcement that from September 3, 1939, to June 13, 1945, a total of 20,429 mines—17,480 German and 2,949 British—had been swept by British, Dominion, and Allied minesweepers and by German minesweepers operating under Allied control, excluding U.S. minesweeping operations. Of the 1,533 minesweeping vessels employed in these operations—1,228 belonging to the Royal Navy, 236 Dominion, and 69 Allied—263 were lost. British personnel engaged totalled 57,055 ; of the officers, 65 per cent. were R.N.V.R.

A similar announcement about minelaying activities stated that, during the war, Royal Navy, Dominion and Allied warships, including minelayers, destroyers, submarines, M.T.B.s, and motor launches had laid a total of 206,969 sea mines, while naval aircraft had laid 53,552 ; the grand total of 260,521 was 28,637 more than the combined total laid by the British Empire, the Allies and Germany during the whole of the 1914–18 war.

On June 5, Mr. Churchill informed Parliament that the Soviet Government had asked for the transfer of certain ships of the Italian fleet and 40,000 tons of merchant shipping. This had been agreed to in principle after the Italian surrender ; but it had subsequently been pointed out that those warships were built to operate in the Mediterranean and were unsuitable for service in the severe climate of the Northern seas where Russia desired to use them, also that the Italian Navy in defiance of German orders had sailed from their bases to surrender honourably to Admiral Cunningham, and had since performed useful service for the Allies in the Mediterranean and Indian Ocean. The Russian request had therefore been met jointly by the Royal and U.S. Navies and Merchant Navies. Great Britain had transferred to Russia on loan the battleship Royal Sovereign (renamed the Archangelsk), eight (ex-American) destroyers, four submarines, and 20,000 tons of merchant shipping. Two of these destroyers, one named the Churchill, had since been lost on active service. The U.S. Navy had transferred the cruiser Milwaukee (now the Murmansk) and 20,000 tons of merchant shipping.

The great expansion and ever-increasing importance of the Naval Air Arm resulted in the appointment, announced on June 11, of an Admiral (Air) to be in charge of all naval-air stations in the British Isles and to co-ordinate all flying training in the Royal Navy. The first Flag officer to hold this appointment was Vice-Admiral D. W. Boyd, lately Fifth Sea Lord and Chief of Naval Air Services.

Remarkable evidence of the sound design and tough construction of the modern cruiser was forthcoming at the end of the war against Germany when it was made known that H.M.S. Argonaut, then serving in the Far East, had not only survived a torpedo attack by a U-boat which had blown away her bows, stern, and two propellers, but that in that condition she had struggled across the Atlantic from the Mediterranean at 4 knots and reached Philadelphia, where she was repaired.

Other remarkable voyages to safety by severely damaged warships were those made by the U.S. carriers Franklin and Bunker Hill. The former, while only 60 miles off the Japanese mainland, had been hit by several heavy bombs and became for hours " an inferno of fire and explosions." Though Vice-Admiral Mitscher gave permission to abandon ship, Captain Leslie Gehres refused to do so, and his scarred and blackened ship was taken in tow by the cruiser U.S.S. Pittsburg and reached Pearl Harbour where she was patched sufficiently to get to America. Her condition may be judged by the fact that her casualties—832 killed and

270 wounded—represented a third of the ship's company. The Bunker Hill was Admiral Mitscher's flagship, and he had a narrow escape from death when, during the Okinawa operations, three Japanese suicide aircraft attacked under cover of low cloud and crashed on board after straddling the ship with 550-lb. bombs. Casualties were 392 men killed and 264 wounded, and 70 aircraft destroyed. For hours her officers and men fought flames fed by blazing petrol soaring to 1,000 feet, and exploding ammunition. Eventually the fires were got under control and Captain George Seitz "with outstanding seamanship" took his battered ship across the Pacific to Puget Sound where she could receive temporary repairs.

The largest British liners, which had played the chief part in transporting American troops across the Atlantic, were now called up to start their big task of taking them back for demobilization or redrafting to the Pacific. On June 20, the Queen Mary arrived at New York with the first contingent of 14,000. The commander of the U.S. Army's Base in the United Kingdom stated that within a year of VE-Day, 2,500,000 of the American troops in Europe would have left. This would require a fleet of 370 ships, which would include the Queen Mary, Queen Elizabeth, and Aquitania and 8 captured German liners; the British liners would carry 50,000 each month, and Air Transport Command another 50,000.

How efficiently this trans-Atlantic ferry service had performed its vital task, under the protection of the Allied naval and air forces, was shown by the announcement of the U.S. War Department that of 4,453,061 American soldiers carried to Europe, 1,094 or only 0·024 per cent. were lost at sea. Of those 1,015 went down in the British troopship Rohna, which was sunk by air attack off Algiers in 1943; bomb damage, the heavy sea, and darkness hampered rescue work.

INDIAN OCEAN.

A Victory March ordered by Admiral Mountbatten took place on June 15 in Rangoon, to celebrate the liberation of Burma. Over 6,000 men took part in this impressive ceremony in which contingents of the Royal Navy, Royal Marines, Royal Indian Navy, Burma R.N.V.R., and the French Navy took part.

It still remained to drive the Japanese out of the more distant territories of this theatre of the war and, on June 20, it was reported that aircraft from carriers of the British East Indies Fleet had bombed enemy airfields in Sumatra and shipping in the Malacca Straits. Buildings, rolling-stock, two ships, and nineteen grounded aircraft were set on fire by the Naval Air Arm without loss. Among the warships taking part were the escort carrier H.M.S. Ameer and the cruiser H.M.S. Suffolk.

FAR EAST AND PACIFIC.

As the month opened the desperate resistance of the enemy in Okinawa neared its end. On June 3, it was reported that a U.S. infantry division had gained control of the deep water anchorage and former Japanese naval base of Nakagasuku on the East coast of the island. The following day it was announced that as the result of an amphibious operation on the West coast a U.S. Marine division had seized the greater part of the Naha airfield. Tokio radio admitted, on June 5, that the Japanese situation in Okinawa was "acute" and on June 14, that it was "desperate"; yet it was not until a week later that Admiral Nimitz could report that all organized resistance had ceased and that the battle for the island was won. It had taken 82 days of the "bloodiest fighting in the Pacific theatre of war," but it gave the U.S.A.A.F. bases only 325 miles from the Japanese mainland and thus laid the whole of that country open to sustained bombing and enabled the enemy's sea communications with his overseas conquests to be effectively cut.

It was also announced on June 21 that five ships of the British Pacific Fleet, which had been engaged in the supporting operations against the Sakishimas, had been hit by suicide aircraft. Later it was made known that during the twelve weeks when the Fleet was in those waters, three of the latest British carriers—the Indefatigable, Victorious, and Formidable, had been hit by *kamikaze* aeroplanes. Though damage had been caused, and 70 men had been killed and 34 seriously wounded, all the carriers were able to remain in action. The only British warship put out of action was the destroyer, H.M.S. Ulster. During these operations, too, naval aircraft accounted for 140 of those of the enemy, destroyed or damaged.

Despite the call on Allied forces for the Okinawa operations, the Americans intensified their air attacks on the Japanese mainland. On June 4, between 450 and 500 Super-fortresses bombed the city and port of Kobe in a daylight raid, dropping some 3,000 tons of fire bombs. Docks, factories, and shipyards were set alight. Attacks were also made by U.S. naval aircraft on airfields in Kyushu, and eight enemy ships were sunk off that island and in the Yellow Sea. Some idea of the extent to which Japan had already suffered from this bombing was given in a broadcast by Tokio radio on June 9, which said that between March and May 4,930,000 people had been rendered homeless, and 1,195,000 houses had been destroyed in the five largest cities—Tokio, Nagoya, Yokohama, Osaka, and Kobe.

Truk, the Japanese base in the Carolines, which had been by-passed in the rapid advance to the Philippines, was bombarded and bombed by the British Pacific Fleet on June 14 and 15. Airfields, docking facilities, harbour craft, radio stations, and shore defences were among the targets. Only moderate enemy fire was encountered and there was no aircraft opposition.

Operations, which began in May, for the recovery of a British possession over-run by the Japanese in their thrust to the southward continued with the landing of the famous Australian 9th Division on the morning of June 10, in Labuan Island and other points in the Brunei Bay area, North Borneo. Under cover of what was described as overwhelming naval and air support, this was effected without the loss of a man. The convoy of 200 ships was the largest used in the South-West Pacific since the Lingayen Gulf operations. The warships taking part included the U.S. 7th Fleet and ships of the Royal Australian Navy, one being H.M.A.S. Hobart. Four days later it was reported that Labuan Island with its airfield had been captured. A further foothold was secured in British Borneo when troops of the same Australian Division, despite heavy surf, landed unopposed by the enemy at Lutong in Sarawak.

Damage to twenty-one ships of the U.S. 3rd Fleet in a violent typhoon in the Pacific on June 5, was subsequently made known by Admiral Nimitz. They included the 35,000-ton battleships Alabama, Indiana, and Massachusetts; the 27,000-ton carriers Bennington and Hornet; the 10,000-ton carriers Belleau Wood and San Jacinto; the escort carrier Bougainville;

the 13,000-ton cruiser Pittsburgh; and the destroyers Blue and John Rodgers. The worst damage was suffered by the Pittsburgh, over a hundred feet of the bows being torn off by the tremendous seas; nevertheless she made her way under her own power to Guam, 900 miles distant, and not a man of her ship's company of more than a thousand was injured. None of the ships was sunk, and all returned to their station after repair.

Certain changes in U.S. naval high commands, announced from his headquarters in Guam by Admiral Nimitz on June 8, indicated that a policy of resting Flag officers who had borne an exceptionally heavy strain in sea-going commands was being followed; for example, Admiral Halsey, after four months ashore, returned to the command of the 5th Fleet, while Admiral Spruance who had commanded that Fleet with conspicuous success and gallantry during the Iwo Jima and Okinawa operations and Vice-Admiral Mitscher commanding the aircraft carriers were both given shore appointments. It was made known at the same time that Admiral Nimitz had taken direct control, as C.-in-C. Pacific Ocean Areas, of all forces in the Ryukus, including the U.S. 10th Army.

LOSSES.

No British ships were reported as lost during June. U.S. naval losses made known were :—

Destroyers—Luce and Morrison, sunk in Okinawan waters. Twiggs and William D. Porter, sunk by *kamikaze* aircraft, also off Okinawa.

Submarine—Swordfish.

Minesweeper (ex-destroyer) Emmons, sunk after being hit by five *kamikaze* aircraft off Okinawa.

The Polish Admiralty, on June 16, announced the following losses of Polish warships :—1 cruiser—Dragon; 4 destroyers—Wicher, Grom, Kujawiak, and Orkan; 1 minelayer—Gryf; 2 submarines—Orzel and Jastrzab; and 15 other craft—a total of 23 ships aggregating over 30,000 tons.

JULY.

Additional facts and figures in regard to the Battle of the Atlantic were published during this month: 460 German and 65 Italian submarines were sunk by Allied naval and air forces, also 81 " midget " U-boats were captured or sunk in the North Sea; 75,000 merchant ships were escorted across the Atlantic in 2,200 convoys, the largest of which included 167 ships; another 1,250 convoys were covered by shore aircraft; nearly 1,500 merchant ships were escorted in 75 convoys to and from North Russia. The total number of ships sunk by enemy action in the Battle of the Atlantic was 574; this represented 1 in every 131 ships that made the Atlantic passage.

British Empire merchant seaman casualties were officially given for the years of war from September 3, 1939, to May 31, 1945, as 30,867 killed (including presumed deaths in missing ships and deaths during internment), 4,690 missing, 4,252 wounded, 5,506 internees—total 45,315.

It was generally realized that Soviet Russia had been materially assisted by overseas supplies delivered via the Arctic route to northern ports, but a War Office statement made known that since the opening of the Persian Gulf route in 1941 over 5,000,000 tons of war supplies had been sent through the Gulf and thence overland via Persia and Iraq, the peak month being July 1944, when 292,028 tons were delivered to Russia by this route.

The announcement of the posthumous award of the V.C. to Lieutenant-Commander Gerard Roope, R.N., made on July 10, also gave some details of the gallant fight under his command of the destroyer H.M.S. Glowworm, lost on April 8, 1940, in a single-handed encounter with the Admiral Hipper. The Glowworm was escorting the battle cruiser Renown when, on April 7, she stopped to pick up a man washed overboard in a heavy sea. She lost touch with the other destroyers and was making for a rendezvous in West Fjord when she met two German destroyers. The enemy broke off action in heavy weather and the Glowworm pursuing them encountered the Admiral Hipper. As conditions did not permit him to shadow the enemy cruiser, Lieutenant-Commander Roope decided to close and inflict as much damage as possible. After firing all his torpedoes unsuccessfully, and although his ship was already badly hit, he rammed the Admiral Hipper. Having done so, he withdrew and in a sinking condition secured a hit by gun-fire at 400 yards. The Glowworm was by then riddled by enemy fire, and capsized and sank. The Hipper stood by for at least an hour and rescued 31 of the crew of 149. She landed these survivors at Trondheim as prisoners of war, and then had to go to Germany for repairs. Particulars of this action were made known by the Glowworm's only surviving officer—Lieutenant R. A. Ramsay, on his repatriation after the war. He was awarded the D.S.O.

U-530 surrendered to the Argentine authorities at a seaside resort near Buenos Aires. Her captain and crew of 54 were all reported to be in an advanced stage of malnutrition; they had been away from a home port since March 13. A week after the ship's company had been interned, the Argentine government announced, on July 17, that they would be handed over to the British and U.S. governments with all available information. An inquiry carried out by the Argentine naval authorities exonerated the U-530 from having caused the loss of the Brazilian cruiser Bahia, which blew up and sank about 100 miles from Pernambuco earlier in the month. Of her complement of 427, at least 294 were killed.

The Dover Command, which in this as in the 1914–18 war had been a separate naval command, reverted to its peace-time status as part of the Nore Command on July 10.

On July 15, Admiral Sir Harold Burrough, formally Naval C.-in-C., Allied Expeditionary Force, assumed the post of British Naval C.-in-C., Germany. In that capacity he advised the Military Governor—Field-Marshal Montgomery—on the disarmament and control of the German Navy and he also acted as senior British Naval Representative on the Allied Control Commission.

A reversion to an ancient usage came about with an Admiralty announcement, on July 8, that the title of G.O.C. Royal Marines had been changed to Commandant-General, Royal Marines.

The announcement was made in Washington that Admiral Henry K. Hewitt was succeeding Admiral Harold R. Stark as commander of U.S. Naval Forces in Europe.

INDIAN OCEAN.

Systematic progress in the elimination of the Japanese from the Malayan theatre of war was recorded by a S.E.A.C. *communiqué* which announced that between July 5 and 10 the British East Indies Fleet had carried out sustained minesweeping operations in the approaches to the Malacca Straits. These had been undisturbed by the enemy. Simultaneously a combined air attack and bombardment had been carried out by H.M. ships and naval aircraft against objectives in the Nicobar Islands, while carrier-borne aircraft had bombed airfields in North-West Sumatra. The naval force was commanded by Rear-Admiral W. R. Patterson flying his flag in the cruiser H.M.S. Nigeria and having in company the escort carriers Ameer and Emperor, the destroyer Roebuck. and the 6th Minesweeping Flotilla. No casualties or damage were suffered by H.M. ships ; only one pilot was lost. There was no enemy air opposition other than two reconnaissance aircraft, one of which was shot down.

A further announcement by S.E.A.C. said that from July 24 to 26 the British East Indies Fleet, under the command of Vice-Admiral H. T. C. Walker, and including the destroyers H.M.S. Paladin and Rotherham, the 7th Minesweeping Flotilla, and minelayers of the Royal Indian Navy, including H.M.I.S. Punjab, had carried out or supported minesweeping operations off the west coast of Malaya north of the Malacca Straits, bombarded an enemy seaplane base and made a number of bombing attacks on other shore objectives. On July 26, enemy dive-bombers and *kamikaze* aircraft, breaking through the fighter screen, attempted to attack the fleet. The escort carrier Ameer shot down a suicide aircraft making a vertical attack from 6,000 feet. The minesweeper Squirrel struck a mine and had to be sunk by gunfire. There were a small number of casualties.

The Admiralty made known the existence in the Indian Ocean of a secret British naval base, called " Port T." This had been hacked out of virgin jungle on Addu Atoll, a waterless coral islet 500 miles from Colombo. Work on it had commenced in September 1941, when the 1st Royal Marine Coast Regiment, under Lieut.-Colonel (now Major-General) W. B. F. Lukis went ashore to establish coastal batteries, searchlights, signal towers, roads, camps and jetties. The work was accomplished in most difficult conditions and in the first three months 23 per cent. of the force had to be invalided ; nevertheless by the time Japan entered the war " Port T " was ready. On January 3, 1942 the first convoy of troopships, escorted by the cruiser Emerald, arrived. The base was a vital link on the convoy route to Australia—3,000 miles distant. Among the ships which had put in there was the Queen Mary.

FAR EAST AND PACIFIC.

How relentlessly the Allies were closing in on their homeland was brought home forcibly to the Japanese when, on July 14, it was subjected to the first naval bombardment. A fleet, commanded by Rear-Admiral J. T. Shafroth, U.S.N., comprising the battleships Indiana, Massachusetts, and South Dakota ; the cruisers Chicago and Quincy ; and four destroyers, in a two-hours bombardment, poured about 1,000 tons of shells into the port and industrial centre of Kamaishi (Honshu). No opposition was experienced from shore batteries, warships or aircraft. Both before and during the bombardment about 1,000 carrier-borne aircraft ranged over wide areas of northern Honshu and Hokkaido—the northernmost of the main islands composing Japan. Heavy damage was done to the selected targets.

The next day a thousand U.S. naval aircraft again attacked Japan, their main target being the port and steel centre of Muroran, on the south coast of Hokkaido. A great weight of H.E. and incendiary bombs was dropped. The Kyushu and Honshu airfields were also attacked. No opposition was met but in the bad weather twenty-four aircraft were lost and sixteen airmen were missing. Admiral Nimitz reported that as a result of the air operations on July 14–15, 129 locomotives were destroyed, 82 aircraft destroyed or damaged on the ground, heavy damage done to installations and 374 small ships sunk or damaged.

Scarcely had the attack from the air on Muroran ended than the port was subjected to bombardment at short range by another strong task force of the U.S. 3rd Fleet, including the three new 45,000-ton battleships Iowa, Missouri, and Wisconsin. Again the enemy offered no resistance. Great fires were left burning in the town, which was overcrowded with refugees from the devastated cities of Honshu.

On the night of July 16–17, one of the heaviest bombardments of the war was carried out by the U.S. 3rd Fleet and the British Pacific Fleet. From 11 p.m. to nearly dawn a great weight of naval shells was fired into enemy industrial centres, including some of the biggest engineering works in Japan along a 60 to 80 mile stretch of the Honshu coast, north of Tokio. Among the places heavily hit was the industrial town and port of Hitachi. In the course of this operation, battleships approached to within five or six miles of the enemy coast, and cruisers and destroyers frequently steamed at high speed close inshore to bombard at short range. The British Fleet included H.M.S. King George V, the aircraft carrier Formidable, the cruisers H.M.S.s Newfoundland and Black Prince, and the destroyers Barfleur, Grenville, Quickmatch, Troubridge, and Undine. A novel feature in the way of publicity was the " running commentary " of the action broadcast from the U.S. battleship Iowa. Although the Allied Fleets were within a few minutes' flying distance from big Japanese airfields no attempt was made to interfere by enemy aircraft, nor was there any opposition by warships or coast defences. When they withdrew, the coastal sector bombarded was lined with great fires visible many miles out to sea. The British Fleet was under the command of Vice-Admiral Sir Bernard Rawlings, with Vice-Admiral Sir Philip Vian in command of the carriers.

At dawn on the day following this bombardment, some 1,500 British and American naval aircraft continued the assault. British aircraft concentrated on enemy air bases round Ishinomaki Bay, 190 miles north of Tokio, while U.S. aircraft blasted airfields and installations on the Kanto Plain surrounding the capital. No opposition was met except A.A. fire.

On the night of July 18–19, an American cruiser squadron, including the Atlanta, Dayton, Topeka, and Oklahoma City bombarded enemy installations on the east side of Tokio Bay, about 50 miles south of the town. Under cover of the prevailing bad weather, the ships were able to approach to within three miles of the shore. No opposition was met. The climax to the ever-narrowing assaults on the hub of Japan was a daring thrust into Tokio Bay itself on the night of July 22 by nine U.S. destroyers. Under cover of a storm, they shelled and torpedoed an enemy convoy anchored there, and though the weather prevented observation of the results, heavy explosions were heard and two ships were believed to have been sunk. The destroyers suffered no damage or casualties.

These naval and air assaults were so close home that they could not well be ignored by the Japanese government, and Tokio radio attempted to explain the lack of resistance by describing them as " reconnaissances in force " intended to " feel out our homeland air power and dissipate its strength." The Japanese air force, it asserted, was " silently accumulating its might to crush the enemy decisively when he sets foot in our homeland."

Meanwhile people were advised to "laugh and treat the present attacks as a joke."

The next day destroyers of the U.S. 3rd Fleet swept close inshore in Sagami Bay—south-west of Tokio Bay and only separated from it by the tongue of land on which is the Yokosuka Naval Station. Here they found a convoy of four enemy ships, two of which were sunk and others damaged.

Another bombardment of mainland objectives by heavy warships, which included the battleships H.M.S. King George V. and the U.S.S. Massachusetts, was carried out on the night of July 29–30, when over 1,000 tons of shells were fired into the port and industrial centre of Hamamatsu—135 miles south-west of Tokio. After 70 minutes of intensive shelling the port was left burning furiously. Apart from spasmodic A.A. fire there was no resistance.

The time seemed ripe to launch a propaganda attack on Japanese morale, and on July 27, 60,000 leaflets were dropped on eleven towns, all of importance as war production or transport centres, warning the inhabitants that they would be targets for heavy air attacks, urging them to leave immediately, and calling on the Japanese people to overthrow their militaristic government, make peace, and thus save their country from destruction.

Meanwhile, the Allied naval effort was by no means confined to pounding shore objectives, and the remnants of the Japanese fleet were still a worth-while target. On July 18, carrier aircraft of the U.S. 3rd Fleet attacked enemy warships off Yokosuka. Owing to the bad weather they could not be identified, but at the time were believed to be cruisers ; later it was ascertained that one of them was the 32,000-ton battleship Nagato—one of the enemy's few remaining capital ships ; she had been severely damaged, a destroyer and seven torpedo-boats had been sunk, and two more destroyers damaged. On July 24, what was described as "the greatest co-ordinated attacks yet made on Japan" included the bombing by between 1,000 and 1,500 carrier aircraft from the U.S. 3rd and British Pacific Fleets of the remnants of the enemy's fleet sheltering in the naval base of Kure, in the Inland Sea. Despite a strong A.A. barrage, the battleships Ise and Hyuga were much damaged, the heavy cruiser Tone and the light cruiser Oyodo were set on fire, and the heavy cruiser Aoba damaged. British aircraft, attacking enemy vessels near Takamatsu (Shikoku), probably sank an escort carrier of the Kobe class, sank five cargo ships and damaged others and destroyed twelve grounded aircraft. These air attacks on Japanese warships and other military targets near Kure and Kobe were renewed at dawn on July 25, and a U.S. cruiser and destroyer force bombarded the seaplane base at Kushimoto. What must have been practically the knock-out blow to the Japanese navy was given in a concentrated 6-hour raid, again by U.S. and British carrier aircraft, on July 28 : the battleships Ise and Hyuga were left beached and burning with their decks awash ; the cruisers Tone, Aoba, and Oyoda were put out of action ; great damage was done to the aircraft-carriers Amagi and Katsuragi, and to the escort carrier Kaiyo ; 54 other enemy ships, including several destroyers, three submarines, merchantmen and small craft were sunk, and 90 others damaged.

General MacArthur announced on July 5 that, apart from isolated guerrilla actions in the mountains, the Philippines campaign was over and the archipelago with its 17,000,000 inhabitants liberated.

SOUTH-WEST PACIFIC.

Another firm foothold in Borneo was secured when, on July 1, the 7th Australian Division was landed on the south-east coast, 2 miles east of Balikpapan. A preliminary bombardment by the U.S. 7th Fleet and ships of the Royal Australian Navy and bombing by aircraft smashed up enemy beach defences, and resistance was light. Over three hundred warships took part in the operation, including the cruisers H.M.A.S.s Hobart and Shropshire. Commenting on the Borneo campaign, General MacArthur said : " Swiftly following our seizure of Brunei Bay and Tarakan, the enemy's key Borneo defences are now isolated or crushed. . . . The speed, surprise and shock of these three Australian operations have secured the domination of Borneo and have driven a wedge southward, splitting the East Indies. The strategic Macassar Strait . . . is now controlled by our surface craft, aircraft, and submarines. . . . Our shipping can now, with land-based cover, go to any point in the south-west Pacific." On July 7, Balikpapan Bay—a valuable anchorage in East Borneo—was brought under Allied control. In North Borneo, it was reported on July 13, all organized enemy resistance had virtually ceased in the Brunei Bay area, which was being rapidly brought into use as an Allied naval air base.

The U.S. Navy Department announced on July 2 that the British submarine Trenchant, commanded by Commander A. R. Hezlet, D.S.C., R.N., operating in the South-West Pacific under the American command, had torpedoed and sunk the 10,000-ton Japanese cruiser Ashigara. Later, Commander Hezlet was awarded the U.S. Legion of Merit for this exploit.

Early in the month it was made known that H.M.S. Duke of York had arrived at Sydney on her way to join the British Pacific Fleet.

It was reported that, on May 29, Admiral Soemu Toyoda had been removed from the command of the Japanese Combined Fleet, the post of C.-in-C. of the newly established naval over-all command, and that of C.-in-C. of the naval escorts command. All these appointments had been given to Vice-Admiral Jiraburo Ozawa, Vice-Chief of the Naval General Staff and President of the Naval Staff College. Admiral Toyoda was appointed Chief of the Naval General Staff in succession to Admiral Koshiro Oikawa.

LOSSES.

No British man-of-war was reported to have been lost during July.

The U.S. submarine Trigger was reported to be overdue and presumed lost.

AUGUST.

Everything else that happened during this month was put in the shade by the war ending at midnight of August 14–15 with the unconditional surrender of Japan. Three major events brought home to the Japanese government the hopelessness of their resistance and led swiftly to this dramatic climax ; these were :—

(1) On August 6, the first atomic bomb was dropped on Hiroshima.
(2) On August 8, the U.S.S.R. declared war on Japan.
(3) On August 9, a second atomic bomb was dropped on Nagasaki.

The threats of a new and powerful enemy and of a novel and terrifying weapon provided the Japanese government with any " save face " they required; but, as this Chronicle will have shown, they were already menaced by ever-increasing bombardment and bombing by the Anglo-American naval and air forces, and invasion in great strength, with all its attendant afflictions, was imminent. Doubtless the end was hastened, but even without these additional inflictions it had already become inevitable.

HOME.

At home, the clearing up process had already begun. On August 1, the U.S. forces handed over the advanced amphibious base at Falmouth, the Royal Ordnance depot at Portsmouth, and the Dunkeswell (Devon) airfield, which they had used during the later stages of the war; while in France the Royal Navy handed back the administration of the port of Calais to the French authorities.

Another war-time secret was released by the Admiralty description of a "phantom" fleet of dummy warships, similar to that used in the 1914–18 war. Under the instructions of Mr. Churchill, when First Lord, the 7,900 ton merchant ships Pakeha and Warinana, of the Shaw Savill Line, had been given an elaborate superstructure of canvas and plywood, and with wooden turret guns were painted to resemble the battleships Revenge and Resolution; the s.s. Mamari was also camouflaged to look like the aircraft-carrier Hermes. The Mamari was wrecked and the other two dummies, having served their purpose, were reconverted. The veteran battleship Centurion, used as a distant-control target ship before the war, was converted in 1941 to an imitation of the newly-completed Anson. In this disguise the ship did a 20,000 mile trip round the Cape to Bombay. In June 1942, while in a Malta convoy, she was repeatedly attacked by bombers and damaged, but shot down a Stuka. Caught in the monsoon in the Indian Ocean, her "A" turret was swept overboard. Finally she was sunk as one of the blockships, which saved the situation when the gale sprang up soon after the invasion of Normandy had started by providing cover for the landing craft from the high seas threatening the prefabricated harbour.

INDIAN OCEAN.

On August 28, H.M.S. Nelson arrived at Penang and H.M.S. London at Sabang where they embarked Japanese naval envoys from Singapore who provided charts of minefields and other information which would enable the Fleet to make a safe passage through the Malacca Strait.

FAR EAST AND PACIFIC.

The Allied Navies continued their shattering assaults on the Japanese mainland and home waters up to the very end of hostilities, while Super-Fortresses, under Admiral Nimitz's orders, mined every important harbour, thus achieving a "complete shipping blockade of the Japanese homeland." On August 8, British and U.S. carrier aircraft attacked shipping, airfields and other targets in Northern Honshu. The following day, when the second atomic bomb was dropped (on Nagasaki), 1,500 Allied naval aircraft bombed targets in N.E. Honshu. For the first time since the American Third Fleet appeared in Japanese home waters *kamikaze* aircraft attempted to interfere, but without success; at least two were shot down in flames and no warship was damaged. The attacks were continued and it was announced from Admiral Nimitz's headquarters that in two-day raids a total of 711 enemy aircraft had been destroyed—the majority on the ground; 23 ships, including 5 destroyer escorts, had been sunk and 50 damaged, for the loss of 7 American and 7 British aircraft. British cruisers and destroyers, on August 10, bombarded at short range the industrial town of Kamaishi, 90 miles north of Sendai; docks and warehouses were much damaged. At dawn on August 15, Allied carrier aircraft had started an attack on the Tokio area when the "Cease Fire" order was received and the operations were suspended; some of the aircraft which were already on their way to Tokio dropped their bombs in the sea. After Japanese wireless had broadcast the surrender, enemy aircraft attempted to attack ships of Admiral Halsey's Third Fleet and sixteen were shot down.

On August 16, the combined U.S. Third and British Pacific Fleets steamed in close formation off the Japanese coast. Admiral Nimitz, at his Guam headquarters, stated that the Allied fleets operating against Japan consisted of 133 fighting ships, including 8 U.S. battleships, 16 U.S. carriers, 19 U.S. cruisers, 62 U.S. destroyers, and 28 British ships. Among the latter were the battleships H.M.S. Duke of York—flagship of Admiral Sir Bruce Fraser—and King George V.; the carriers Formidable, Implacable, Victorious, and Indefatigable; the cruisers Newfoundland, Achilles, Uganda, Gambia, Black Prince, and Euryalus; and 17 destroyers. There were also a large number of auxiliary and supply ships in the Fleet Train.

What was described as "one of the greatest international armadas ever assembled," under the supreme command of Admiral Halsey, U.S.N., arrived, on August 27, in Sagami Bay, when Admiral Sir Bruce Fraser made the historic signal to the Admiralty: "The Fleet has anchored in Japanese waters."

How vigorously the Royal Navy had joined forces with the U.S. Navy for the final overthrow of Japan was illustrated by the simple announcement, on August 10, that H.M.S. Anson had arrived at Sydney to join her sister-ships, the King George V., Duke of York and Howe; this meant that all the very latest British battleships had been sent to the Far East.

On August 29, after the completion of minesweeping operations, nine Allied ships led by the U.S. cruiser San Diego, flying the flag of Rear-Admiral Oscar Badger, steamed into Tokio Bay. They carried British and American Marines detailed to land at the Yokosuka base, and on the strongly defended islands in the bay, to neutralise the fortifications. The same day Fleet Admiral Nimitz arrived by seaplane from Guam and hoisted his flag in the battleship South Dakota. It was announced that, in addition to the U.S. Third Fleet, the Fifth and Seventh Fleets and the North Pacific Force would be assembled for the occupation of Japan; the Third Fleet would operate mainly in the Tokio area, and the other fleets in waters off Korea, in the Yellow Sea and as far south as Hainan.

Hong Kong became a British naval base once more when a powerful fleet, consisting of H.M.S. Anson, the aircraft carriers Indomitable and Venerable, the cruisers Swiftsure and Euryalus, six destroyers, eight submarines, seven Australian minesweepers, and a Canadian supply ship—all under the command of Rear-Admiral Cecil Harcourt, entered the harbour on August 30.

An official statement from American naval headquarters at Guam gave details of the condition of the Japanese fleet at the end of the war. This said that Japan had lost all but 49 of the 369 warships with which she entered the war and her shores were strewn with the wreckage of her navy. Of her battleships, only one—the Nagato—remained afloat and she was lying at Yokosuka, severely damaged and without a crew. Of her first-line carriers, only the Hataka—lying severely damaged at Sasebo—and the Katasaragi—in a similar condition at Kure—were left. All her escort carriers were sunk. Only two heavy cruisers—both at Singapore severely damaged—remained afloat. Only two light cruisers were left out of 24. Destroyers had been reduced from 165 to 26, and first-line submarines from 140 to 16 in addition to 6 former German U-boats. A revised and detailed list of Japanese naval losses, with the dates and causes, was published by the U.S. Navy Department on September 20—too long for inclusion in this Chronicle * ; but the summary, which accompanied this statement, is of particular interest and can conveniently be inserted here :

	Total sunk or out of action	Sunk by :				
		Sub-marines	Aircraft	Surface craft	Combination	All other agents
Battleships	12	1	6	3	1	1
Aircraft Carriers ..	15	4	9	—	2	—
Escort Carriers ..	4	4	—	—	—	—
Heavy Cruisers ..	16	4	8	2	2	—
Light Cruisers ..	20	10	7	2	1	—
Destroyers	126	42	45	27	5	7
Submarines ..	125	26	12	64	4	19
Total	318	91	87	98	15	27

LOSSES.

No British warships were named as having been lost during August.

U.S. ships reported lost were :—

Cruiser—Indianapolis, sunk by enemy action in the Philippine Sea with 880 killed and missing, and 316 wounded.

Destroyers—Parrott, Tucker, and Worden.

Submarine—Bullhead.

A summary of the total U.S. Navy losses during the war was published by the Navy Department on October 1, but can conveniently be given here. Excluding small craft, the U.S. Fleet lost two battleships—the Arizona and Oklahoma, both sunk at Pearl Harbour, the latter being scrapped after raising ; five carriers—the Lexington, Hornet, Wasp, Yorktown, and Princetown ; six escort carriers ; ten cruisers—the Houston, Astoria, Quincey, Vincennes, Northampton, Juneau, Atlanta, Chicago, Helena, and Indianopolis ; 71 destroyers, 11 destroyer escorts, and 52 submarines.

SEPTEMBER.

There remains but one more epic event to chronicle—the recovery of Singapore and with it the reinstatement of the British Empire in the Far East.

A passage having been swept through the Malacca Strait by mine-sweepers of the Royal and Royal Indian Navies, Admiral Sir Arthur Power, C.-in-C. East Indies Fleet, arrived at Singapore on September 3, in H.M.S. Cleopatra. On the following day, H.M.S. Sussex arrived with Rear-Admiral Holland and General Christison who signed, on behalf of Admiral Lord Louis Mountbatten, an agreement for the British occupation of Singapore with General Itagaki, who came on board. At 11.30 a.m. on September 5, British, Indian and Gurkha troops landed amidst wildly cheering crowds and were met on the quayside by General Itagaki and other Japanese officers. It was found that, apart from bomb damage caused by Allied raids on the dock area, which was immediately taken over by the Royal Navy, the city was completely undamaged.

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* See Chapter XI, p. 151.

On September 10, an Allied naval force, including H.M.S. Nelson flying the flag of Vice-Admiral H. T. C. Walker, the French battleship Richelieu, the cruiser H.M.S. Royalist, escort carriers and destroyers arrived at Singapore. The same day the 34th Indian Corps was landed at Port Swettenham and Port Dickson on the Malayan coast north-west of Singapore, while troops of the 5th Indian Division crossed the causeway to the mainland and entered the Johore State. These landings, stated Admiral Mountbatten, would have been carried out on September 9, which would have been " D-day " in Malaya, had the war not ended.

The official surrender of all the Japanese forces in S.E. Asia took place on September 12, in the Council Chamber of the Municipal Buildings in Singapore. Over sixty Allied warships were in harbour. Admiral Mountbatten, as Supreme Commander in S.E. Asia, received the Japanese plenipotentiaries who signed the instrument of surrender, which he countersigned. In doing so, he said, " I wish to make this plain—the surrender to-day is no negotiated surrender. The Japanese are submitting to the superior force now massed here."

So ends this naval record of the greatest war the world has ever seen—the most dire threat to the Empire, and the slow but sure recovery to end in the dual victories of the Allies. But before we close this fateful chapter of British history, and " lest we forget " it is as well to realize what was the cost of our unpreparedness against aggression in the toll of men and ships. Too often it is asserted that this was a cheaper war as regards casualties than that of 1914–18. As regards the Navy, the truth is the exact reverse. When introducing the Navy Estimates for 1946, the First Lord—Mr. A. V. Alexander—said that nearly 51,000 officers and men, excluding the Dominion Navies and Royal Marines, were killed or reported missing; this was over 20,000 more than in the 1914–18 war. Losses of H.M. ships from September 3, 1939 to August 31, 1945, including vessels requisitioned on naval service, amounted to 3,282. British warship losses, included in that figure, were 3 battleships and 2 battle-cruisers—representing one-third of our capital ship strength at the outbreak of war ; 5 fleet carriers ; 30 cruisers ; 142 destroyers ; and 77 submarines.

Gallantry cannot be represented in figures, but it should be recorded that up to December 31, 1945, nearly 15,000 awards, including 23 V.Cs., were made to officers and men of the Royal Navy, the Dominion Navies, the Royal Marines, and the Reserves.

E. Altham.

CHAPTER III.

FOREIGN NAVIES.

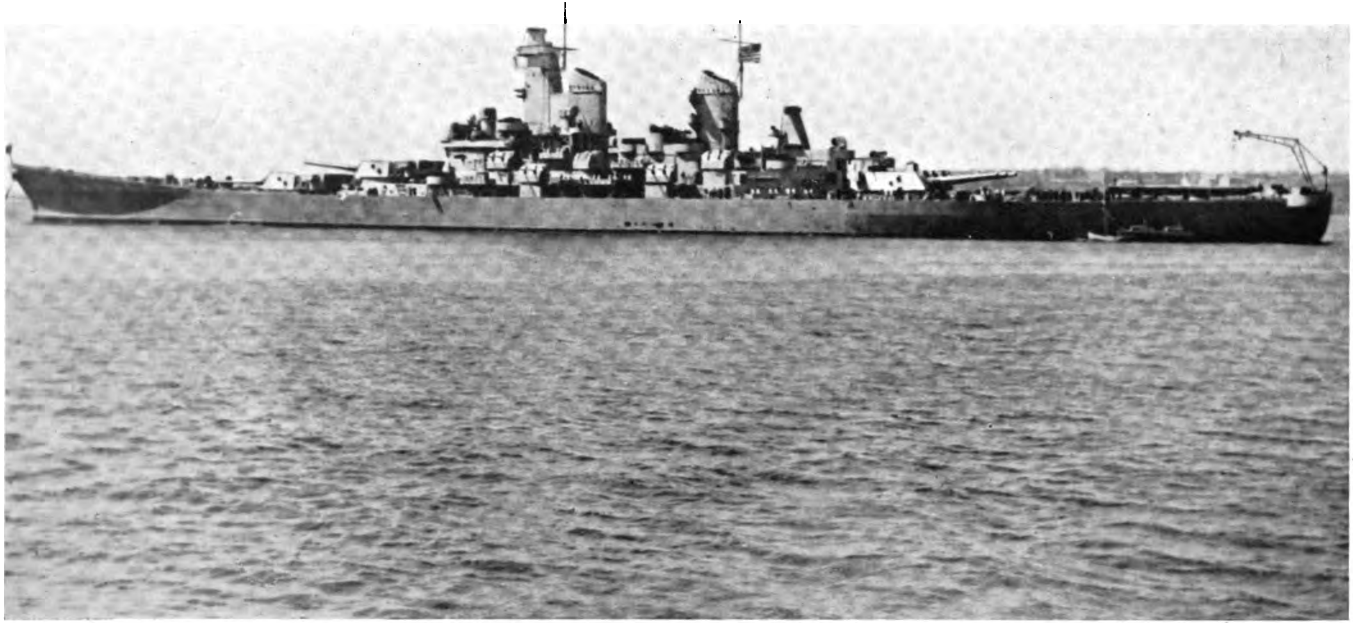
WITH the cessation of hostilities, and the subsequent stocktaking of enemy prize tonnage, numerous additions have been made to the strength of Allied Navies. Many more transfers may be expected when the final distribution of the Italian fleet is effected. New construction has been largely halted abroad, as in this country, by the necessity for devoting the principal shipbuilding effort to the replacement of mercantile tonnage, depleted by the war. Various obsolete or war-damaged ships have been discarded to provide scrap for this purpose. This gives an opportunity of contrasting the various fleets as they were in 1939 with their present composition. In the case of the United States Navy, there has been a marked increase in both numbers and tonnage, but in practically every other instance a more or less considerable reduction will be observed.

So far as neutral navies are concerned, changes have been relatively fewer, though two (Spain and Sweden) have embarked on considerable programmes of new construction. Any further plans are likely to await, in all countries, the results of the atomic bomb tests in the Pacific this year before being carried into effect. There is considerable support for the belief that these experiments may encourage the development of the submarine as the warship of the future ; but this does not take fully into account the possibilities of atomic weapons other than bombs, which may alter the shape of the problem.

UNITED STATES.

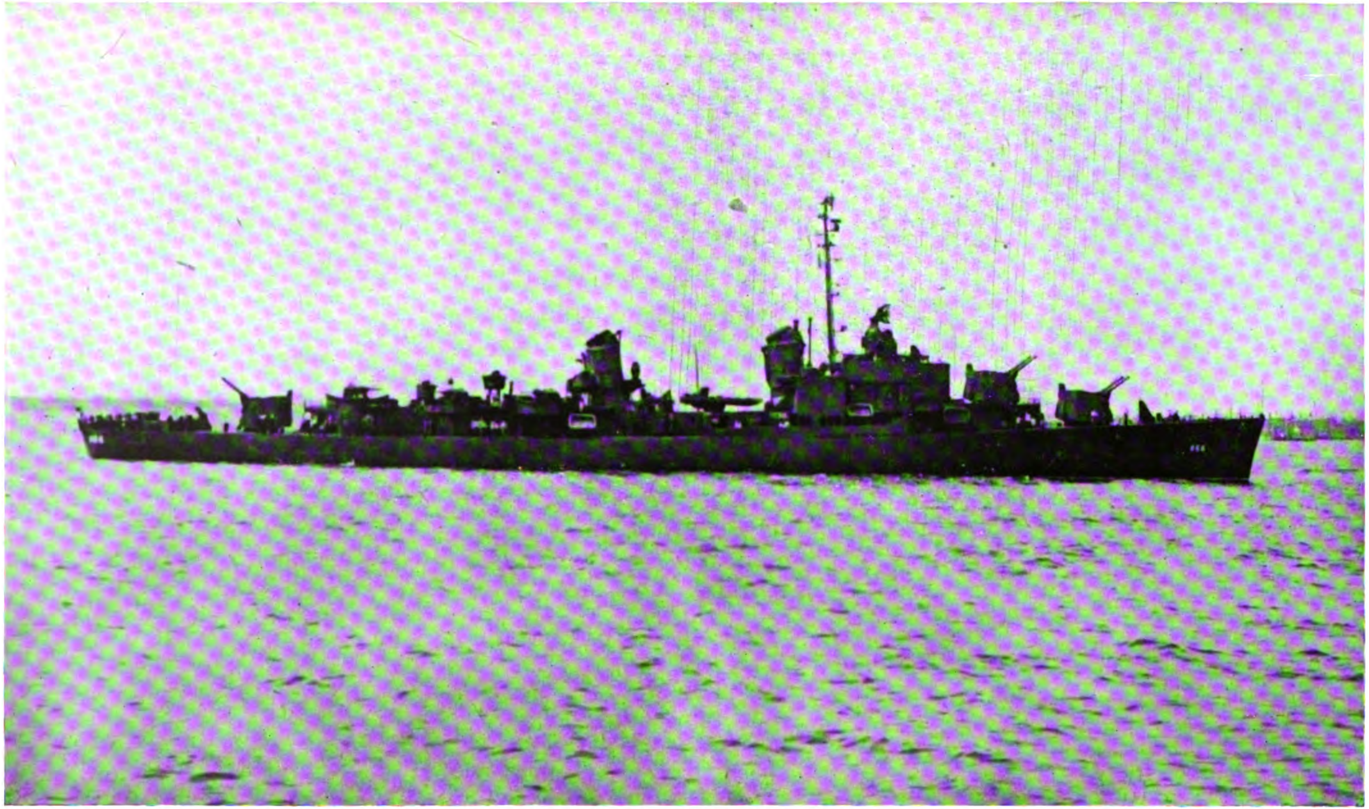
For the fiscal year from July 1, 1945, to June 30, 1946, the total appropriations for the United States Navy amounted to $24,116,411,064, or about $4,400,000,000 less than the preceding year's peak figure. This drop in expenditure was accompanied by a corresponding, but greater, proportionate reduction in the total personnel on service, which, having reached 4,064,435 in August, 1945, is expected to have fallen by the summer of 1946 to about 550,000, including the Navy, the Marine Corps and the Coast Guard.

On June 9, 1945, Mr. Artemus L. Gates, up till then Assistant Secretary for Air, succeeded Mr. Ralph A. Bard as Under-Secretary of the Navy, on the latter's return to business. The latter has since become President of the Navy League. Mr. John L. Sullivan filled the vacancy as Assistant Secretary for Air. On December 15, 1945, Fleet Admiral Chester W. Nimitz relieved Fleet Admiral Ernest J. King as Chief of Naval Operations in the Navy Department at Washington—an appointment roughly equivalent to that of First Sea Lord of the Admiralty. Admiral Raymond A. Spruance succeeded Fleet Admiral Nimitz as Commander-in-Chief, Pacific Fleet, but after a few weeks was transferred to the command of the Naval War College at Newport, Rhode Island. Admiral John H. Towers then took over the command of the Pacific Fleet. Admiral H. Kent Hewitt has been appointed to command the Twelfth Fleet, to be stationed in the Mediterranean. Admiral Thomas C. Kinkaid has replaced Vice-Admiral Herbert F. Leary as Commandant of the Eastern Sea Frontier. Admiral



U.S.S. Iowa, Battleship.

(Official U.S. Navy photograph.)



U.S.S. Cone, Destroyer.
(Official U.S. Navy photograph.)

R. S. Edwards has similarly relieved Admiral Royal E. Ingersoll in the corresponding Western Sea Frontier appointment.

Under an executive order from the President, a General Staff for the Navy has been constituted. Its members comprise the Secretary of the Navy, the Chief of Naval Operations and the Assistant Secretary of the Navy, together with the following flag officers: Admiral C. P. Snyder, Naval Inspector-General; Vice-Admiral D. C. Ramsey, Vice Chief of Naval Operations; Vice-Admiral F. P. Sherman, Deputy Chief of Naval Operations (Operational); Vice-Admiral W. H. P. Blandy, D.C.N.O. (Special Weapons); Vice-Admiral L. E. Denfeld, D.C.N.O. (Personnel); Vice-Admiral W. S. Farber, D.C.N.O. (Logistics); Vice-Admiral R. L. Conolly, D.C.N.O. (Administration); Vice-Admiral A. W. Radford, D.C.N.O. (Air); and Rear-Admiral E. W. Burrough, head of the general planning group of the U.S. Navy. A new division, the Office of Research and Invention, has been added to the Navy Department, under the direction of Rear-Admiral H. G. Bowen. A permanent committee has been set up in the Office of the Chief of Naval Operations under Rear-Admiral W. S. Delany, to co-ordinate and review all naval training facilities and activities.

ADMINISTRATION.

Proposals for drastic changes in the uniforms of enlisted men seem unlikely to be carried out in their entirety. The Navy Department went to the expense of manufacturing 2,400 suits for distribution to men in the fleet for trial, but failed to win anything approaching general approval. In fact, complete disapproval is said to have been signified by fully 75 per cent. There was strong opposition to the proposed abolition of bell-bottomed trousers; while efforts to introduce white shirts were met by the criticism that laundry facilities afloat would be inadequate to deal with them. It is believed, therefore, that practical objections will reduce alterations to an insignificant level.

Reorganisation of the principal fleets involved the laying up in inactive condition of a very large number of ships and the scrapping of others. Preservation of laid-up vessels from corrosion is to be achieved by spraying all metal surfaces with a new anti-corrosive compound, spread over in a wax-like film. This material is reported to be extraordinarily economical in use, a small quantity covering quite a considerable surface. An element in the process is an automatic dehumidifying plant, connecting with ships' ventilating systems and fire mains, to inject dry air into every compartment and expel all moisture. The first ship so treated was the 10,000-ton light cruiser Brooklyn.

Under the plan outlined in the report of the Secretary of the Navy, dated January 10, 1946, it is proposed that the ready reserve shall include 7 battleships, 18 fleet aircraft carriers, 62 escort carriers, 31 cruisers, 178 destroyers, 254 destroyer-escorts, and 101 submarines. In the active fleets there would be 4 battleships, 13 fleet aircraft carriers, 13 escort carriers, 28 cruisers, 135 destroyers, 36 destroyer-escorts, and 90 submarines. Naval aircraft in active condition would number 3,627. Transports and landing craft sufficient to cover a force of two and a half divisions would also be maintained in a state of readiness.

Industrial activities at U.S. Navy Yards have been integrated into one comprehensive organisation, and these establishments will in future be known as Naval Shipyards. Authority for the internal management of each yard is now centralised in the hands of a properly trained and empowered officer who may come from the group designated for "Engineering duty only," and who is charged with the management control of all shipyard functions. He is designated, and has all the prerogatives of, a commanding officer, and is of flag rank. "Logistic" activities in the locality of each yard, such as the ammunition depot, supply depot, Marine barracks, receiving station, and hospital, have been integrated with the shipyard into an organisation known as U.S. Naval Base. Each of these bases is under the military command of a line (general service) officer Commandant. Thus management of individual activites is left in the hands of individual commanding officers, each a specialist in that field of activity, while the military command of all Base activities is in the hands of the Commandant of the Naval Base. These changes became effective on December 1, 1945.

BATTLESHIPS.

Construction of the fifth ship of the "Iowa" class, the Kentucky, has apparently been slowed down since the end of the war in the Pacific, while work on the Illinois ceased altogether on August 11, 1945, when she was 22 per cent. complete. It is improbable that the Kentucky will be launched until the experiments to be carried out at Bikini, in the Marshall Islands, in July, 1946, in dropping atomic bombs over and around a number of condemned warships, have been carried out and the results analysed. These ships are to include the battleships Pennyslvania, Nevada, New York, Arkansas, and Nagato, the last-named a Japanese prize; the aircraft carriers Independence and Saratoga; the cruisers Pensacola, Salt Lake City, Prinz Eugen (*ex*-German), and Sakawa (*ex*-Japanese); the destroyers Anderson, Bagley, Conyngham, Flusser, Helm, Hughes, Lamson, Mugford, Mustin, Ralph Talbot, Rhind, Smith, Stack, Trippe, and Wainwright; the submarines Apogon, Dentuda, Parche, Pilotfish, Searaven, Skate, Skipjack, and Tuna; and 19 transports, besides landing craft, etc.

Ships to be scapped or otherwise reduced to ineffectiveness are the New Mexico, Idaho, Mississippi, Texas, and Wyoming, the last-named having already been demilitarised for training duties under the London Naval Treaty of 1930. Thus the effective capital-ship strength of the United States Navy will comprise five ships of the "Iowa" class, four of the "South Dakota" class, and two of the "North Carolina" class, together with the three battle cruisers of the "Alaska" class, which are still rated officially as "large cruisers." That their value is regarded as doubtful may be surmised from the fact that all three of these fast new ships have already been laid up in reserve.

AIRCRAFT CARRIERS.

Of the great importance attached to the aircraft carrier in the future organisation of the United States fleet there can be no question. As the Secretary of the Navy put it in his last report, "the carrier is the spearhead of the modern battle fleet." It is proposed to retain the three 45,000-ton fleet carriers of the "Midway" class, together with the 27 of the "Essex" class, and dispose of the remainder, comprising 8 of the "Independence" class, the Enterprise, Ranger, and Saratoga. In the case of the Enterprise, it is understood that approval has been given to a proposal to retain her in demilitarised state as a naval relic, on the same lines as the Oregon and Olympia. There are, besides, two new light fleet carriers, the Saipan and Wright, to be completed shortly. These are ships of 14,500 tons with a speed of 33 knots, corresponding in some respects to the British carriers of "Colossus" and "Majestic" classes.

A total of 79 escort carriers will apparently be kept, 21 in service and 58 in reserve. These will presumably include the ships of the "Commencement Bay," "Sangamon," and "Casablanca" classes, together with some of the "Bogue" class.

CRUISERS.

Heavy cruisers to be retained are understood to be the 17 ships of the "Baltimore" class, the Wichita, 4 "New Orleans" class, Portland, and 3 "Augusta" class. In addition there will be 5 of the new "Dallas" class, now under construction, which will be of 17,000 tons displacement. Thus only the Pensacola and Salt Lake City will be disposed of for the present; and these, as already mentioned, are to be subjects of the atom-bomb experiments. It is also intended to retain 48 light cruisers, comprising the Roanoke and Worcester, of 14,700 tons, under construction; 29 ships of the "Cleveland" class; 9 of the "San Diego" class; and 7 of the "Brooklyn" class, together with the St. Louis. There is so far no confirmation of a report that the nine old vessels of the "Omaha" class, now being scrapped, are not the only ones that will be discarded.

Two of the most recently completed ships of the "Cleveland" class, the Fargo and Huntingdon, have a single funnel, instead of two as in the earlier ships. It may be assumed that the Galveston and Manchester, still to be commissioned, will be of similar appearance.

DESTROYERS, SUBMARINES, ETC.

It is intended to maintain an establishment of 367 destroyers and 296 destroyer-escorts. This will entail the speedy disappearance of practically all destroyers belonging to pre-war programmes of construction, together with over 50 destroyer-escorts, the half-sisters of British wartime frigates of the "Captain" type.

Submarine strength is fixed at 200, covering the war-built "Corsair," "Balao," and "Gato" classes, all older units being due for disposal. Fate of the 800-ton Mackerel and Marlin has not been announced.

Other categories represented in the reorganised fleet of the U.S. Navy are amphibious force flagships (formerly known as General Communications H.Q. Ships), high-speed transports, landing ships (dock), minelayers, minesweepers, attack transports, and attack cargo ships. After allowing for a further proportion of such ancillary units to be laid up in reserve, it is evident that a vast quantity of tonnage will go to the scrapheap, or be turned over to commercial use.

LAUNCHES IN 1945.

During the last year in which the country was at war, the principal ships launched were the battle cruiser Hawaii; the fleet carriers Midway and Franklin D. Roosevelt, of 45,000 tons, the Kearsarge, Oriskany, Philippine Sea, Princeton, Tarawa, and Valley Forge, of 27,100 tons, and the Saipan and Wright of 14,500 tons; the escort carriers Badoeng Strait, Bairoko, Mindoro, Palau, Point Cruz, Rabaul, Saidor, Sicily, and Tinian;

the heavy cruisers Albany, Helena, Oregon City, Rochester, and Toledo; the light cruisers Fargo, Galveston, Huntington, and Manchester, of 10,000 tons, and the Fresno and Spokane, of 6,000 tons. The majority of the 105 destroyers of the "Gearing" class also entered the water during 1945. These are slightly enlarged editions of the "Allen M. Sumner" type, with a displacement of 2,400 tons and a length of 390 feet 6 inches over all. They carry the same armament, six 5-inch guns, twelve 40-mm. Bofors A.A. pieces, and ten torpedo tubes.

A dozen destroyers of the "Allen M. Sumner" class have been fitted as minelayers; and 23 of the "Buchanan" type have been modified for duty as fast minesweepers. A hundred destroyer-escorts of the 1,315-ton turbo-electric design are now converted into fast transports, their armaments being reduced to a few 40-mm. and 20-mm. guns.

There have been various other transformations. The 18 Diesel-electric minesweepers of the "Adroit" class have been adapted for duty as submarine chasers, and now figure in the lists as PC 1586–1603. Eight wooden submarine chasers, and 24 of the steel type have been rearmed as motor gunboats, numbered PGM 1 to 8 and 9 to 32, respectively. Four seaplane tenders of the "Barnegat" class have been turned into motor-torpedo-boat tenders; another, the Biscayne, has become an amphibious force flagship. Two ships of 5,875 tons, the Catskill and Ozark, which were designed as minelayers, are now rated as Landing Ships (Vehicle); the same alteration has been made in the rating of four anti-submarine netlayers of 5,625 tons, the Monitor, Montauk, Osage, and Saugus. Net-laying has been undertaken instead by five ex-cargo vessels specially equipped for the purpose.

A considerable number of L.S.T's. have undergone conversion into repair ships or M.T.B. tenders. Two ex-yachts, the Hilo and Jamestown, also figure in the latter capacity. An escort submarine chaser, ex-PCE 901, is now an auxiliary of the special service type, named Parris Island, as is the former seaplane tender Wright, which has been renamed San Clemente. Four motor minesweepers of the Y.M.S. series, and two ex-submarine chasers, have become surveying vessels. The former submarine tender Antæus has been fitted out as a hospital ship and renamed Rescue. Fourteen old minesweepers of the "Bird" series are now rated as fleet tugs.

The Williamsburg, a vessel of 1,332 tons gross, built in 1931, has taken over the duties of Presidential Yacht in lieu of the smaller Potomac, which, though of about the same age, has been pronounced unseaworthy.

A variety of transfers of ships from and to the Royal Navy have been effected since the war ended. Ships understood to have been returned to the U.S. Navy under the terms of the Lend-Lease scheme include escort carriers; training submarines of the "S" type (American numbering); Coast Guard cutters; frigates (destroyer-escorts) of the "Captain" class; the seven corvettes Dittany, Honesty, Linaria, Rosebay, Smilax, Statice, and Willowherb, of the modified "Flower" class, originally ordered for the U.S. Navy in Canada; 15 patrol vessels of the "Kil" class, originally PCE 827–841; 17 fleet minesweepers of the "Gazelle" class; an uncertain number of motor minesweepers of the BYMS type; 5 boom defence vessels; 22 rescue tugs; 5 salvage vessels; and sundry smaller craft.

On the other hand, the eight corvettes which figured during the war as the U.S.S. Impulse, Surprise, Tenacity, Ready, Courage, Fury, Spry, Restless, Saucy, and Temptress, all belonging to the "Flower" class, have resumed the White Ensign, together with the respective names of H.M.S.

Begonia, Heliotrope, Candytuft, Calendula, Heartsease, Larkspur, Hibiscus, Periwinkle, Snapdragon, and Veronica. There is, however, no word of the U.S. corvettes Action, Alacrity, Brisk, Haste, Intensity, Might, Pert, and Prudent, of the modified " Flower " class, being transferred to the Royal Navy, so it may be assumed that they were purchased outright. Originally these eight ships, when laid down in Canada, were to have been H.M.S. Comfrey, Cornel, Flax, Mandrake, Milfoil, Musk, Nepeta, and Privet, respectively. There has been a good deal of confusion about these various corvettes, an added complication being that the present Snapdragon started as the Arabis—that name in the meantime having been conferred on another corvette which has been lent to the Royal New Zealand Navy. So many correspondents have asked for the answer to this puzzle that it seems well to give this explanation here.

In addition to the Illinois, contracts for a large number of other warships were cancelled during 1944–45. These included three 45,000-ton fleet aircraft carriers of the " Midway " class, together with the Reprisal and Iwojima (*ex*-Crown Point) of the " Essex " class ; 16 escort carriers of the " Commencement Bay " class, 4 of which were to have been named Bastogne, Eniwetok, Lingayen, and Oklahoma ; 3 17,000-ton heavy cruisers of the " Dallas " class, and 7 of the 13,600-ton " Baltimore " class, which were to have been named Bridgeport, Cambridge, Kansas City, Norfolk, Northampton, Scranton, and Tulsa ; the light cruisers Gary and Vallejo, of the 14,700-ton " Roanoke " type, with the Buffalo, Chattanooga, Cheyenne, Newark, New Haven, Tallahassee, Wilmington, and Youngstown, of the 10,000-ton " Cleveland " class ; 47 large destroyers of the " Gearing " class, with the Percival and Watson of special design ; 110 submarines ; 432 destroyer-escorts ; 4 escort vessels, the Macon, Roanoke, Sitka, and Stamford ; 49 wooden submarine chasers ; the large seaplane tender Townsend ; 2 repair ships ; 3 destroyer tenders ; 3 oilers ; 8 petrol carriers ; and numerous other auxiliaries of all kinds.

NAVAL AIRCRAFT.

It is officially claimed that at the end of the war the United States Navy not only possessed the best aircraft in the world, but was on the point of producing newer and still better ones Among the latter were the Grumman Tigercat, a twin-engined single seater fighter with heavy fire power and bomb load. Although this type had arrived in the Pacific by the summer of 1945, it never got into actual combat. Three other fighter types, faster and possessing superior tactical performance to standard designs in service, had undergone satisfactory trials and were in production. These included the Ryan Fireball, the first naval plane to use jet propulsion, together with the Grumman Bearcat and the Goodyear F 2 G, both high-speed, extremely manœuvrable and fast climbing machines. The last-named was the first naval fighter to use the new Pratt-Whitney 3,000 h.p. engine.

The Grumman Wildcat, which was a new fighter at the time of Pearl Harbour, had an approximate speed of 300 m.p.h. and mounted four ·50 cal. machine guns. The Hellcats and Corsairs, which were both carrier- and shore-based on VJ-Day, have speeds of over 400 and 425 m.p.h. respectively, and mount either six ·50 cal. machine guns or proportionate numbers of 20-mm. cannon, in addition to rockets. Bombs weighing up to 2,000 lb. could also be carried by these aircraft when used as fighter-bombers ;

they played a leading part in the tactical development of fighter-bombing. Radar and other technical developments hastened the advent of naval night fighting. Though outclassed by newer types, the Wildcat, with various modifications to increase its speed and rate of climb, continued to be used in escort carriers.

At the conclusion of hostilities the Navy's dive-bomber was the Helldiver, with a speed of over 250 m.p.h. and a bomb-load of 2,000 lb., ultimately supplemented by eight rocket pieces, two 20-mm. and two ·30 cal. machine guns. This compares with the Douglas Dauntless, in use at the outbreak of war, which had a speed of 230 m.p.h. and only half the bomb-load.

Even greater was the contrast between the Douglas Devastator torpedo-bomber, in use when war started, which had a speed of 150 m.p.h. and was very lightly armed, and the latest model of Grumman Avenger, with a speed of over 250 m.p.h., and the ability to carry 2,000 lb. in bombs, or a torpedo, four machine guns and rockets. A modified form of Avenger was employed as a carrier-borne night bomber, to operate with night fighters.

On board battleships and cruisers the Curtiss Seahawk ultimately replaced the Chance-Vought Kingfisher and the Curtiss Seagull for scouting and observation duties. For general purposes, the Martin Mariner has now largely replaced the smaller and lighter Consolidated Catalina, especially for patrol duty. For long distance reconnaissance from shore bases, the four-engined Consolidated Privateer has taken the place of the Consolidated Liberator ; the former has a range of well over 3,000 miles, heavy armament, and exceptionally complete navigational, radio, and radar equipment. Against small enemy convoys, single ships, submarines and islands these aircraft are reported to have done remarkably good work. The latest twin-engined search aircraft is the Lockheed Harpoon, which has supplanted the Lockheed Ventura. It has a range of over 2,000 miles and a speed of more than 200 m.p.h.

Air transport is undertaken by the Martin Mars, the Douglas Skymaster and Skytrain, and the Consolidated Coronado, so far as the Navy is concerned, while the Marine Corps employs the Curtiss Commando for the same purpose.

Established on December 1, 1943, the Naval Air Transport Service's routes now extend over some 80,000 miles, covering nearly three-fourths of the globe. In addition to cargo and passengers, the Service can boast of having flown to combat areas in the Pacific supplies of blood for infusion, returning with wounded when necessary.

It is calculated that improved cooling methods and other modifications have increased the horse-power of standard types of aircraft by fully 10 per cent. without appreciable addition to weight. New superchargers and the adoption of water injection for engines to give greater speed in emergency are other improvements which have been of benefit to fighters. But for the interest taken in its development by the U.S. Navy, it is contended that the air-cooled aircraft engine of to-day would never have reached such a high stage of efficiency.

Jet-assisted take-off is another naval development, which has made it possible for seaplanes to carry much heavier loads than before. The U.S. Navy can also boast of having produced the largest helicopter yet seen in the air.

HEALTH OF THE NAVY.

Statistically the health of the Navy during the war compared very favourably with past experience, in spite of the large proportion of the personnel serving in foreign waters or ashore in regions where endemic diseases and infections were rife. In 1945 the Medical Department was able to apply the experience gained in earlier operations during the assault on the inner defences of the Japanese Empire. Notable improvements in medical care of personnel included a more effective chain of evacuation, in which aircraft played an important part, provision for smoother and more rapid flow of medical supplies to the fighting zone, and the development of an intensive programme of preventive medicine, which tended to keep illness at a low level.

It is a truism that, in wars of the past, disease and infection have borne the responsibility for the majority of deaths and disablements in the armed forces, as compared with battle casualties. Modern medical practice and knowledge have gone far to check this tendency. Statistics also show that chances of survival have improved to such an extent that, out of the total number of wounded who lived until they could receive medical care, 98 per cent. were saved.

As a consequence of the bloody struggles for Iwo Jima and Okinawa, complicated by Japanese *kamikaze* attacks from the air, casualty deaths in the first six months of 1945 rose to 8·7 per thousand as compared with 4·3 per thousand in 1944. Taking deaths from all causes, the comparison was 11·9 per thousand in the first half of 1945 against 6·7 per thousand in 1944. It may also be noticed that the percentage of total strength in hospital averaged 2·5 per thousand in the first half of 1945 against 2·1 in 1944.

An impressive example of the effect of war strain may be seen in the cases of mental disease, which rose steadily from 9·5 per thousand in 1941 to 14·2 per thousand in 1944.

No small degree of credit for improved health figures may be awarded to medical research, which has developed new drugs, new applications of earlier discoveries and new techniques. Prevention and care of burns, use of blood plasma, transportation of blood to battle areas, and improved methods of healing fractures may be mentioned, to say nothing of the widely extended use of penicillin.

COAST GUARD.

At the end of the war there were 1,677 Coast Guard craft on active service, while 326 ships of the Navy and 254 Army vessels were manned by Coast Guard personnel.

Supervisory control of the handling and stowage of explosives was extended in 1945 to naval ammunition depots with port facilities, as well as to naval bases in the Pacific and to European ports from which munitions were being transferred to the Pacific. An intensive educational campaign against oil pollution in American ports was started. After the surrender of Japan, the Coast Guard undertook the task of supervising the handling and loading of explosives for return to the United States.

In July 1945, 64 fixed and 17 mobile long-range navigation stations were being operated by the Coast Guard. Those installed on Iwo Jima and Okinawa facilitated the successful bombing of the Japanese mainland. On the Atlantic and Pacific coasts and in Alaska, 45 radar beacon stations were being operated by the Coast Guard; these are able to give the distance and bearing of any ship or aircraft within a radius of 120 miles. Studies are being made of the possibility of designing lightships capable of being operated without regular crews on board.

Nine air stations on the coasts of the United States are maintained by the Coast Guard with a total of 165 aircraft. These have been active in air-sea rescue operations, assistance being rendered in 686 plane crashes and 786 lives being saved during the year. In addition, 5,357 emergency medical cases were transported, and 149 obstacles to navigation and derelicts reported for removal.

Thirteen new cutters of 2,000 tons, the "Owasco" class, are either in service or completing. These ships have turbo-electric machinery, a speed of 18 knots, and have cost $2,300,000 each without armament. As replacements for the old cutters transferred to the Royal Navy under the Lend-Lease scheme, they represent a very considerable addition to the strength of the Coast Guard fleet. All were built by the Western Pipe and Steel Company, Los Angeles, with the exception of the Mendota and Pontchartrain, the construction of which was undertaken by the Coast Guard Shipyard at Curtis Bay, Maryland.

CASUALTIES.

From December, 1941, to September, 1945, the total casualties of the U.S. Navy, Marine Corps and Coast Guard amounted to 56,206 dead, 8,967 missing and 80,259 wounded.

FRANCE.

The Office of Minister of Marine is for the time being in abeyance; Vice-Admiral Lemonnier remains Chief of the Naval Staff.

Having borne her share in the war in the Far East, the 35,000-ton battleship Richelieu has returned to home waters, and is for the time being the only effective capital ship in the French Navy. Her sister ship, the Jean Bart, has been taken in hand for completion and rearmament, but it will be at least a year before she is ready. The Lorraine, now 33 years old, has been utilised as a gunnery training ship.

H.M.S. Colossus, a modern fleet carrier of 14,000 tons, has been lent to the French Navy for a couple of years, together with her complement of aircraft.

Good progress is reported to have been made with the construction of the 8,000-ton cruiser De Grasse, the design of which has been modified in conformity with war experience. In its main features it is likely to follow that of the Algérie, scuttled at Toulon, though the armament will be lighter, comprising nine 6-inch, twelve 3·9-inch and twenty-eight 40-mm. guns, with six torpedo tubes. No provision will be made for aircraft.

To reinforce the depleted flotillas, eight ex-German destroyers and seagoing torpedo boats, originally allotted to the Royal Navy, have been turned over to the French fleet. These are the Hoche and Marceau, of about 2,600 tons, formerly Z25 and Z31 respectively; the Desaix and Kléber, 2,300 tons, previously named Paul Jacobi and Theodor Riedel respectively; the Alsacien, Lorrain (1,200 tons), Baccarat and Bir Hakeim (600 tons), which were respectively numbered T23, T28, T11, and T20 when under the German flag. It will be observed that the displacement of the four largest vessels has proved to be considerably more than the figures given out by the enemy, in this respect corresponding to the practice in the case of such ships as the Bismarck, Tirpitz, Scharnhorst and Gneisenau.

Only five torpedo boats of the 610-ton Melpomène class have been found in seaworthy condition, and these have been relegated to reserve duties. Serviceable submarines number 24, the Marsouin, Beveziers and Orphée having been scrapped, while the Minerve foundered in tow and the Pégase proves to have been lost through air attack off the coast of Indo-China in 1945. Four more, which were laid down under the 1937 and 1938 programmes, are being completed ; one of these, La Créole, was relaunched at Le Havre quite recently, and should soon be finished. Two German prizes, U2325 and U2518, have been handed over to France for experimental use.

It is now known that the sloop Amiral Charner was bombed and sunk in the Far East, while one of her sister ships, the D'Entrecasteaux, has been scrapped as not worth refitting. There remain therefore only three of this type, the Dumont d'Urville, Savorgnan de Brazza and La Grandiere. Two corvettes which were launched for the French Navy on the Tees in 1940 hoisted the White Ensign instead on completion ; these are La Malouine and the Nasturtium (which was to have been named La Paimpolaise). There is no news of their having gone to France, and it seems probable that their places were ultimately taken by two of the seven corvettes now serving under the Tricolour.

Apparently the last of the *avisos* built in 1916–19, the Amiens, Calais, and Marne, have now been removed from the effective list.

Names have been given to the four additional *aviso-dragueurs* of the Chevreuil type under construction, of which the first, the Bisson, is nearing completion, while the other three—Commandant Amiot d'Inville, Commandant de Pimodan, and Commandant Ducuing—are reported to be well advanced.

Motor minesweepers now number 54, comprising 32 of the 135-ft. YMS type, six of the 126-ft. MMS series and sixteen of the 105-ft. group. There is only one survivor of the flotilla of river gunboats formerly maintained in the Far East, believed to be either the Mytho or Tourane.

When refitted in the United States the aviation transport Béarn was rearmed ; she now mounts four 5-inch, 38 calibre, dual purpose guns, with numerous 20-mm. Oerlikons. Two vessels intended to serve as seaplane tenders, the Sans Peur and Sans Souci, are being completed instead as surveying vessels, and will be renamed Lapérouse and Beautemps-Beaupré, respectively. The former surveying vessel Lapérouse became yet another Far Eastern casualty.

Auxiliaries transferred from the United States Navy include three petrol carriers, the Aroostook, Conasauga, and Guyandot, and three boom defence vessels, the Pepperwood, Rosewood, and Yew. Of three French merchantmen taken over for auxiliary duties, two, the Barfleur and Quercy, are being returned to their owners ; but a third, the Cap des Palmes, may remain in the Navy.*

RUSSIA.

There is no sign of any relaxation of the secrecy in which the affairs of the Soviet Navy have long been enveloped ; but it is believed that the old battleship Petropavlovsk (ex-Marat) is no longer effective as the result of extensive war damage. Her two sister ships, the Gangut and Sevastopol, are believed to be worn out, leaving only the Arkhangelsk (formerly H.M.S. Royal Sovereign) with any pretensions in the way of fighting value. How many cruisers are serviceable is uncertain, but it is doubtful if the total exceeds half a dozen, including the Murmansk, previously the U.S.S. Milwaukee, and the German prize Nürnberg. Losses in destroyers are believed to have been fairly heavy, and not more than five of the 2,900-ton Leningrad type are believed to survive. Seven modern torpedo craft were allotted to Russia from the surrendered German fleet, these being the Z33, Friedrich Ohn, Erich Steinbrinck, Karl Galster, T33, T17, and T12. Out of eight American-built destroyers which were transferred from the Royal Navy in 1944, one was lost.

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* See also Chapter VI.

In submarines the position is still less clear, though the total of effective units is believed to be considerably less than formerly supposed. Three of the British-built " U " type, acquired in 1944, have been numbered B2 B3, and B4; they were previously the Unbroken, Unison, and Ursula. A fourth, the B1, formerly H.M.S. Sunfish, has been lost.

Material transferred from the United States Navy includes 49 steel submarine chasers of the PC series, 46 wooden craft of the SC group, 26 of the PTC type, and 150 motor torpedo boats. There are also half a dozen wooden minesweepers of the YMS design, ten larger steel vessels of the " Advocate " class, and 15 miscellaneous auxiliaries.

Motor minesweepers acquired from the Royal Navy or Royal Canadian Navy include two of the 105-ft. and about a dozen of the 126-ft. types. A great many auxiliaries and small craft of the German Navy have also gone to Russia, including the wireless-controlled target ship Hessen, with her control tender, the Blitz.

OTHER EUROPEAN COUNTRIES.

BELGIUM.

The 1600-ton fast sloop Aretevelde, completed by the Germans at Antwerp, has been recovered, and is reported to have been found in good condition. It is understood that the old sloop Zinnia also remains in existence, though it is improbable that she will be retained in service much longer.

DENMARK.

Mr. Harald Petersen is now Minister of Defence, with Vice-Admiral A. H. Vedel as Commander-in-Chief and Director-General of the Ministry of Marine.

New names have been given to the two 710-ton destroyers under construction in the Royal Dockyard at Copenhagen. They are to be called Willemoes and Hvitfeldt, after distinguished figures in Danish naval history, instead of Najaden and Nymfen, as originally proposed.

Very few of the torpedo boats scuttled in August, 1943, have been found worth refitting. Those in a serviceable state are the Havkatten, Springeren, Hajen (ex-Söridderen), and Narhvalen, vessels of 110 tons, dating from 1917–19. Six new torpedo boats have been laid down as a first instalment of the replacement programme.

The old minelayer Lossen, together with the mining tenders Kvintus and Sixtus, have been written off as total losses, but the Lindormen has been repaired and is now being used as a training ship. Similar employment has been found for the surveying vessels Freja and Hejmdal.

FINLAND.

From all the information that can be gathered, it would appear that the Finnish Navy has emerged from the war with a surprising amount of its material intact, including the coast defence ship Väinämöinen, the gunboats Hamenmaa, Uusimaa, and Karjala, all five of the small submarine flotilla, and the majority of the other vessels. Casualties seem to have been confined to the coast defence ship Ilmarinen and a few small craft.

GREECE.

Further additions have been made to the Royal Hellenic Navy in the shape of destroyers and submarines. These include the ex-British destroyers Catterick, Lauderdale, and Tanatside, of the "Hunt" type, which have become the Greek ships Navarkhos Hastings, Ægean, and Adrias, respectively. An earlier Adrias, previously H.M.S. Border, has been scrapped as the result of war damage. A larger destroyer, H.M.S. Ilex, is also reported to be destined to pass under the Greek flag, together with the frigate Cuckmere.

New submarines are the Amphitriti and Xifias, their previous names in the Royal Navy having been Untiring and Upstart, respectively. Probably they are replacing the old submarines Nereus and Papanicolis, remnant of the flotilla of six with which Greece entered the war.

NETHERLANDS.

Vice-Admiral C. E. L. Helfrich is now Commander-in-Chief of the Navy, with Vice-Admiral J. W. Termijtelen as Chief of the Naval Staff.

Construction of two cruisers laid down before the war, the Eendracht and Zeven Provincien, is to be resumed. They are ships of 8,350 tons, and will be armed with ten 5·9-inch, fourteen 40-mm., and eight 13-mm. guns, with six torpedo tubes.

Four destroyers have been purchased from the Royal Navy, the Scourge, Scorpion, Serapis, and Quilliam. Their respective Dutch names are Evertsen, Kortenaer, Piet Hein, and Banckert. All carry the similar armament of four 4·7-inch, two to four 40-mm. and eight 20-mm. guns and eight torpedo tubes.

Old submarines have been scrapped or condemned on a wholesale scale, those that have been removed from the list including O19, O15, O14, O10, O9, K14, K15, K12, K11, K9, K8, and the Zeehond.

Three gunboats of 1,268 tons laid down in 1939 were completed by the Germans during the war. One of them, K1, was subsequently lost, but the remaining two have been recovered and are under refit. K3 is to be named Van Speijk, but the name of K2 has not yet been advised.

The sloop Soemba is now employed as a training ship, and her sister, the Flores, is an accommodation ship at Rotterdam. The old minelayer Medusa has been put to similar use. Three minesweepers of 525 tons, the Abraham van der Hulst, Pieter Florisz, and Willem van Ewijk, were recovered from enemy hands, but the first-named has since been scrapped.

Eight fleet minesweepers of the Australian-built "Bathurst" type have been acquired, and named Ambon, Banda, Batjan, Boeroe, Ceram, Morotai, Ternate, and Tidore, after islands in the Moluccas. There were already in service over 20 motor minesweepers of the MMS and BYMS series.

NORWAY.

The Minister of Defence is now Hr. J. Chr. Haug. Rear-Admiral Thore Horve is the new Commander-in-Chief, with Commodore Storheil as Chief of the Naval Staff. Both these officers served with distinction in command of destroyers during the war.

New ships, which are being purchased, are understood to include the cruiser H.M.S. Arethusa, of 5,220 tons, and four destroyers of the " Battle " class, one of which is reported to be H.M.S. Namur.

As the result of energetic sabotage, only one of the two 1,220-ton destroyers building at Horten has survived. Her superstructure and armament will be modified in conformity with war experience, as a consequence of which her completion may be deferred. The torpedo boats Troll, Snögg, and a dozen more of older and smaller designs have been removed from the effective list.

Other vessels discarded are the coast defence ship Harald Haarfagre (launched in 1897), and the submarines of the " B " class. War losses have now been found to include the Tordenskjold (sister to the Harald Haarfagre), and the minelayer Olav Tryggvason. The minesweeper Mandal was wrecked in September, 1945.

Five fleet minesweepers, the Bangor, Blackpool, Qualicum, Romney, and Sidmouth, have been taken over from the Royal Navy.

POLAND.

Of the Polish-manned warships which have been operating with the Royal Navy for so long, three have now been earmarked for transfer to the Warsaw Government. These are the destroyers Blyskawica and Burza and the submarine Wilk, of which only the first-named is believed to retain much fighting value.

There are also reported to be under the Polish flag in the Baltic the small minesweepers Czajka, Mewa, Rybitwa, and Zuraw, recovered from the Germans ; and the submarines Sep, Rys, and Zbik, which were interned in Swedish waters during the war.

Polish-manned ships of the Royal Navy, such as the cruiser Conrad (ex-Danae), the destroyers Krakowiak, Slazak, Piorun, and Garland, and the submarines Dzik and Sokol, remain in British waters, no announcement having been made as to their ultimate disposal.

PORTUGAL.

The British fleet minesweeper Caraquet, built in Canada, has been purchased for conversion into a surveying vessel. She will be named Almirante Lacerda. The gunboat Macau, the patrol vessel Lince, and the surveying vessel Berrio have been struck off the effective list.

ROUMANIA.

It is understood that the Roumanian Navy has emerged from the war with a force comprising two destroyers, two old torpedo boats, one submarine, two motor gunboats, six motor torpedo boats and a few minor craft. Apparently the destroyers are the old Marasti and Marasesti, which date from 1919. The more modern Regele Ferdinand and Regina Maria have become prizes of the Soviet Navy.

SPAIN.

The second quartette of gunboats of the Cortes class have now been launched. They are ships of 1,710 tons with a speed of 20 knots and a main armament of six 4·1-inch guns, and in the Royal Navy would be rated as sloops. Destroyers of the Churruca class have had their secondary armament replaced with four 37-mm. and four 20-mm. anti-aircraft pieces.

SWEDEN.

In November last the cruiser Göta Lejon, of 7,500 tons, was launched from the Eriksberg yard at Göteborg. Her sister ship, the Tre Kronor, may be ready for commissioning by the end of the year. The new destroyer Olaud, of 1,800 tons, was launched at the Kockums yard, Malmö, in December. She will have a main armament of four 4·7-inch guns. The submarines Ulven, Bävern, and Uttern have been discarded.

TURKEY.

As H.M.S. Ithuriel, lent to the Royal Navy by Turkey during the war, had received heavy damage, she was scrapped and another destroyer, H.M.S. Oribi, turned over to the Turkish Navy instead. She has been given the name Gayret, originally to have been that of the Ithuriel, while the latter's sister ship, the Inconstant, has now become the Muavenet.

Three submarines which were temporarily the British P611, 612, and 614 have gone back to the Turkish Navy, in which they figure as the Murat Reis, Oruc Reis, and Burak Reis. A fourth vessel of the class was lost as the P615. Presumably Turkey will be given another submarine in her place.

The oiler Adour, taken over by Turkey in 1942 as the Istanbul, has been retroceded to France. Four motor minesweepers, numbered 63, 65, 88, and 150, have been acquired from the Royal Navy, together, it is reported, with a batch of Australian-built fleet minesweepers.

YUGOSLAVIA.

The Yugoslav fleet has been reduced to insignificant proportions as the result of the war. It still possesses one submarine, the Nebojsa; a corvette, the Nada; the armed yacht Beli Orao; the depot ship Hvar; and a few small craft of doubtful fighting value.

SOUTH AMERICAN REPUBLICS.

ARGENTINA.

Their Werkspoor 4-stroke Diesel engines having at last been delivered, it may be assumed that the sloops Murature and King will soon be completed, if indeed they are not already in service. The four old German-built destroyers, Catamarca, Cordoba, Jujuy, and La Plata, relegated to harbour duty some time ago, are believed now to have been removed from the effective list.

BRAZIL.

Four additional destroyer-escorts were taken over from the United States Navy last year; their names are Babitonga (ex-Alger), Baependi (ex-Cannon), Benevente (ex-Christopher), and Bocaina (ex-Marts). Like the four previously acquired they are of Diesel-electric design. A transport, the Duque de Caxias, previously the Orizaba, was transferred at the same time.

CHILE.

The cruiser General O'Higgins, one of the famous series of " Elswick cruisers " of which the Italian Giovanni Bausan (1883) was the earliest, has been removed from the effective list after nearly half a century afloat. She mounted four 8-inch, ten 6-inch and thirteen 3-inch guns on a displacement of 7,996 tons. Another vessel to be discarded is the destroyer Almirante Lynch, launched at Cowes in 1913.

Three corvettes, the Stellarton, Strathroy, and Thorlock, have been purchased from the Royal Canadian Navy, and will presumably be re-classified as *escampavias*. A merchant vessel which became a total loss in Chilean waters, the Gundulic (ex-Winfried) has been salved and refitted as a transport and named Magallanes.

CUBA.

Three 110-ft. coast guard patrol vessels have been built in a Cuban yard, but were still awaiting delivery of armament and machinery from the United States according to the last reports received. The transport Columbia has been lost through stranding.

ECUADOR.

Two yachts acquired for patrol service during the war are the former U.S.S. Opal, of 495 tons gross, and Turquoise, displacing 565 tons. In neither case is the speed above 10 knots.

MEXICO.

From official information now to hand, it seems that the patrol craft taken over in 1943–44 numbered five in all. Three of 100 tons came from the U.S. Navy and two of 47 tons from the U.S. Coast Guard.

PARAGUAY.

This republic acquired six 45-ft. picket boats from the U.S. Coast Guard in 1944 for river service.

PANAMA.

The nucleus of a navy has been obtained in two coastguard inspection craft, formerly the U.S. yard patrol boats 162 and 539.

URUGUAY.

The submarine chaser acquired from the United States Navy proves to be the former PC 1234, a steel vessel 165 feet in length. She has been named Maldonado.

VENEZUELA.

A number of corvettes were bought from the Royal Canadian Navy in 1945, of which some were to be used for naval and others for mercantile service. Two, the Carabobo and Independencia, were reported to have been wrecked in transit, and a third, the Constitucion, seems to have disappeared. Those actually incorporated in the Venezuelan Navy are understood to be named Federacion, Independencia, and Victoria, so it is possible that it was the Constitucion and not the Independencia that was in fact lost.

Two motor launches of the Fairmile " D " type have been acquired from the R.C.N. for service on Lake Maracaibo. The gunboat Miranda, built on the Clyde half a century ago, has been scrapped.

ASIA AND AFRICA.

CHINA.

A number of ships are being transferred to China from the Royal Navy and the United States Navy. So far the only one which is definitely known to have hoisted the Chinese ensign is the corvette Petunia, now the Fu Po ; but it is understood that the cruiser Aurora, of 5,270 tons, is to follow, together with a destroyer of the " Hunt " type, two " U " class submarines and eight harbour defence type motor launches. From the U.S. Navy will come four destroyers (or possibly destroyer-escorts) and four submarine chasers.

It is not yet known whether the half-dozen or so ships which were in the hands of the Nanking " quisling " administration were recovered intact or not.

EGYPT.

During the war the transport Sollum (formerly the " Flower " class sloop Syringa) and the salvage tug Pharos were lost. Four motor patrol boats, taken over temporarily by the Royal Navy and rated as harbour defence motor launches, have presumably been returned.

F. E. McMurtrie.

CHAPTER IV.

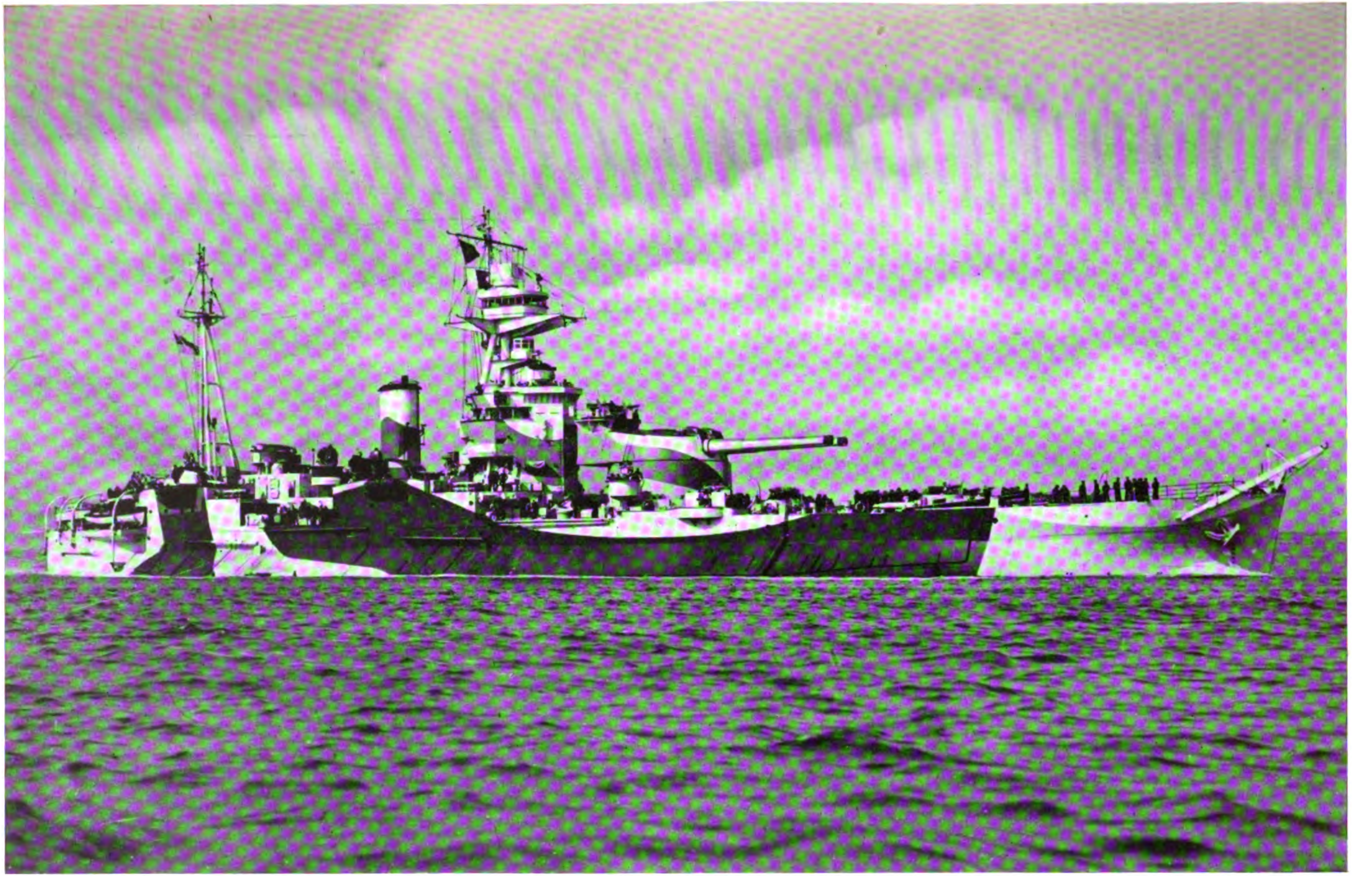
THE RESTORATION OF BRITISH SHIPPING.

Before Japan surrendered British shipowners had completed their plans for the restoration of the merchant fleets which constitute this island country's lifeline. They were not only considering what ships should be built to replace those which had been lost by enemy action or marine risk, but were making preparations for reconditioning and refitting surviving ships.

They had been precluded from creating adequate reserves for these purposes since they had been paid only a nominal 10 per cent. under the Government's terms of hire—5 per cent. interest on the pre-war value of their ships—little more than half the replacement costs—and 5 per cent. for depreciation. It was at once obvious that, when the insurance money had been collected on account of the tonnage which had been sunk, the owners would not have sufficient funds to restore the various fleets of passenger liners, cargo liners, tramps, oil tankers, and coasting vessels to their pre-war strength. In the case of the P. & O. Group, Sir William Currie, the Chairman, has stated that the deficiency will amount to about £12,000,000 ; other companies are in much the same position.

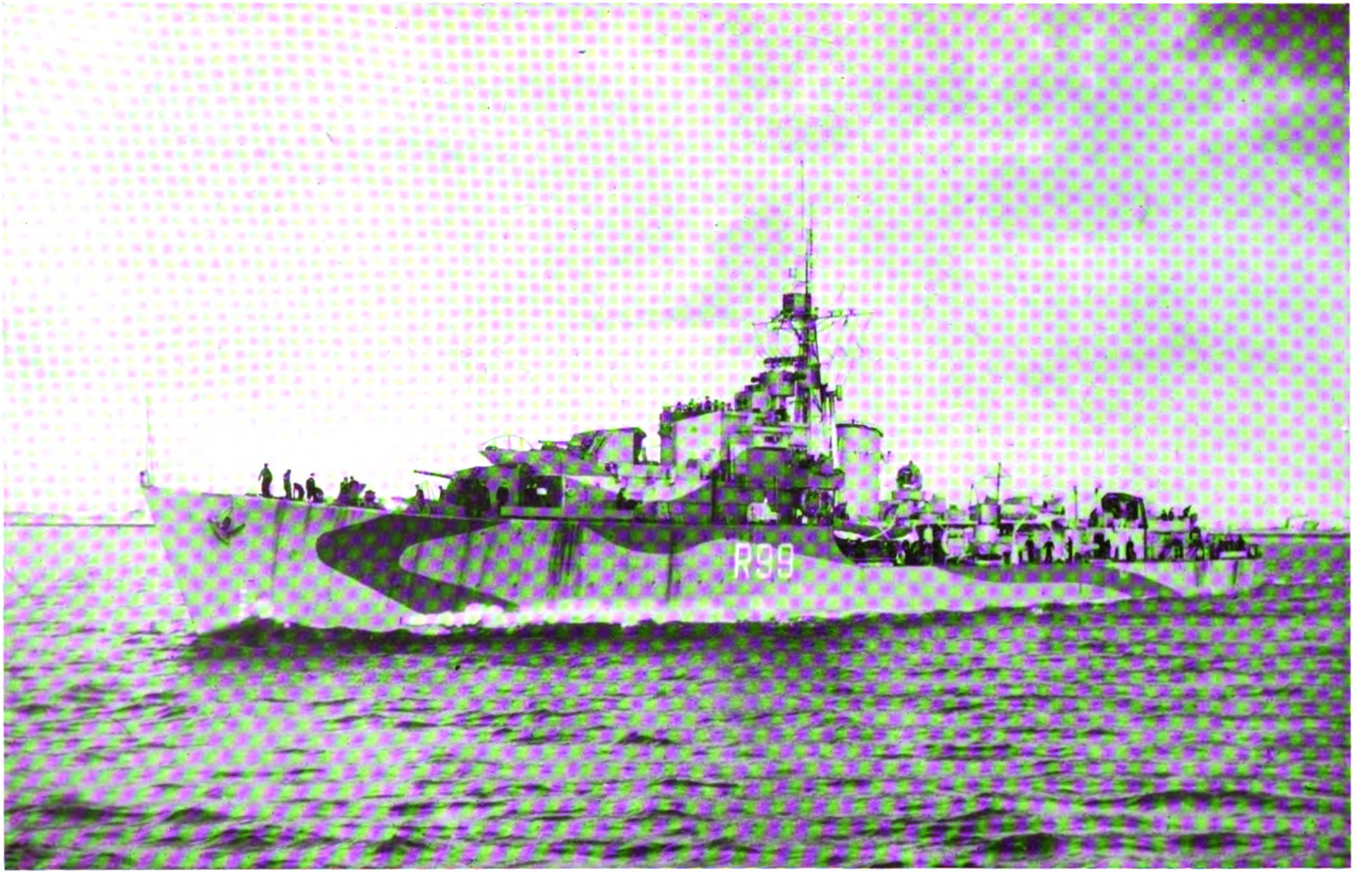
The United Kingdom entered the war with about 22 million tons of shipping, excluding vessels of less than 100 tons, well balanced as to types. In the course of the struggle, more than half that tonnage had been destroyed, while a large proportion of the remainder, owing to exceptionally severe conditions of service and the necessary neglect of all but urgent repairs, had greatly depreciated in efficiency during the six years. The Chamber of Shipping, in its report for 1945–46 which was published in February last, recorded that, looking back on the whole period of the war, the position was strikingly illustrated by the losses of tramp cargo vessels upon which the country so largely depends for its supplies of food and raw materials. By the end of the war, out of some 750 deep-sea tramps which were afloat at the beginning, 571, or nearly 75 per cent. had been sunk. Other sections of the industry also suffered grievously. Of the great liner fleets of some 1,100 vessels (8½ million gross tons) which existed in 1939, about half were sunk. Tanker owners lost about 50 per cent. of their vessels, and among the coasters and smaller ships the destruction, including losses on the Normandy beaches and at Dunkirk, was also heavy. Some of the lost tonnage, the Chamber stated, had been replaced by new construction or purchase, but a detailed examination of the position showed that on June 30, 1945, the shipping on the United Kingdom Register was less than three-quarters of what it had been at the beginning of the war.

With the assistance of the Ministry of War Transport, the Chamber prepared a statement showing the type of ships of 500 tons gross and upwards which existed on June 30, 1945, separating those belonging to the shipping companies and those which had been built on Government account, and including vessels on requisition or charter from the United States and other governments which would have to be returned in due course.



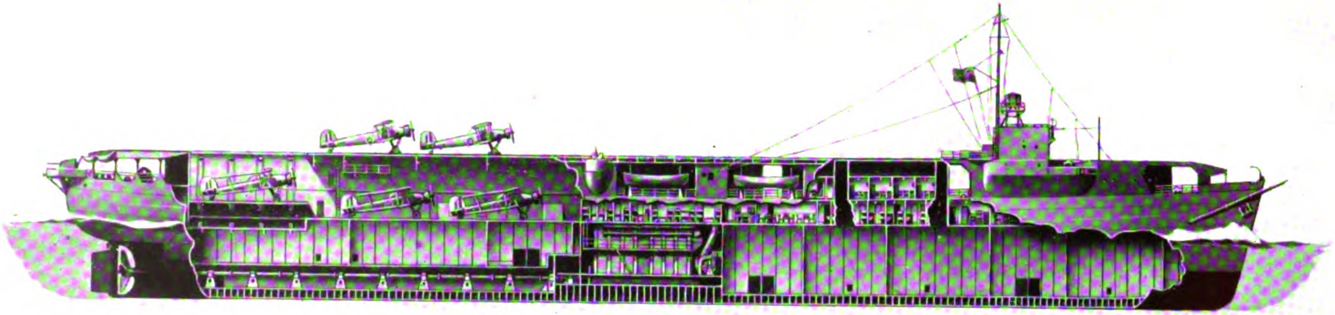
H.M.S. Abercrombie, Monitor.

(*Courtesy of Messrs. Vickers-Armstrong.*)



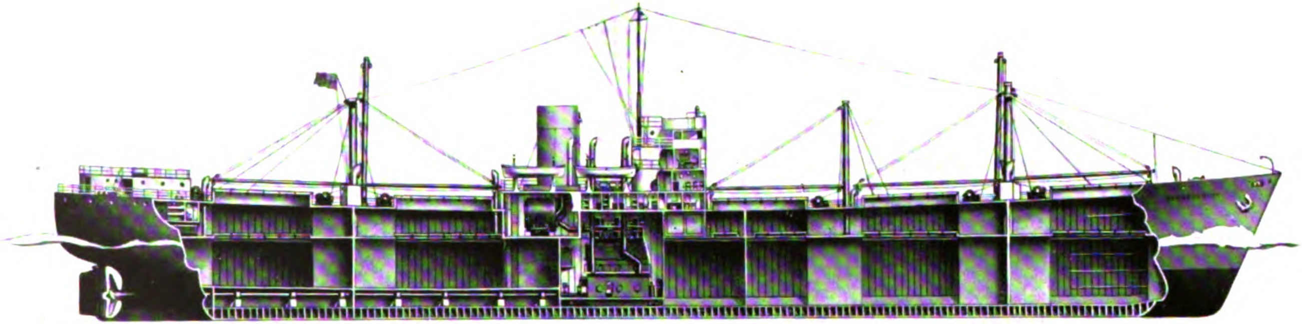
H.M.S. Urchin, Destroyer.

(Courtesy of Messrs. Vickers-Armstrong.)



Merchant Aircraft Carrier Empire Mackendrick completed by Burntisland Shipbuilding Company, April 1943. 7,950 tons gross, 13 knots. Cargo capacity, 7,930 d.w. ; 6 aircraft.

(By courtesy of builders.)



M.V. Derrycunihy, launched November 1943 by Burntisland Shipbuilding Company; 7,093 tons, gross.

(By courtesy of builders.)

500 TONS GROSS AND OVER.

	Private Ownership.		Government Ownership.		Requisitioned or Chartered.		Total.	
	No.	*Gross tons.*	*No.*	*Gross tons.*	*No.*	*Gross tons.*	*No.*	*Gross tons.*
Passenger liners ..	92	646,000	14	166,000	5	22,000	111	834,000
Passenger cargo liners	220	1,753,000	16	127,000	24	243,000	260	2,123,000
Cargo liners	629	3,162,000	73	491,000	7	27,000	709	3,680,000
Tramps	671	2,037,000	336	1,715,000	502	2,748,000	1,509	6,500,000
Tankers	266	1,659,000	162	903,000	31	75,000	459	2,637,000
Total	1,878	9,257,000	601	3,402,000	569	3,115,000	3,048	15,774,000

The change in the balance of commercial sea-power under the flags of the leading maritime nations which had been brought about by the war was a disquieting factor in the peace outlook. On the one hand, Germany and Japan had been banished from the trade routes, while, on the other, the shipbuilding drive which was undertaken in the United States—contributing materially to the defeat of the Axis Powers—had resulted in such a rapid expansion of American shipping as placed the United States, for the first time in the history of shipping, far and away ahead of every other country, in spite of losses sustained at the hands of the enemy. The figures prepared by the United States Maritime Commission—in dead-weight and not gross tons, which are usually used by British statisticians—were as follows :—

	1939.	1945.
United States	12,100,000	56,800,000
British Empire	23,300,000	19,600,000
Norway	6,400,000	3,950,000
The Netherlands	3,300,000	2,090,000
France	2,900,000	1,300,000
Greece	2,700,000	1,700,000
Soviet Union	1,500,000	1,200,000

Such was the change in the balance of commercial sea-power which had been brought about by the war.

It was subsequently revealed that though the Socialist Government, which came into office as a result of the General Elections, had determined to nationalise the railways, long-distance road transport, the ports and docks, as well as the canals and civil aviation, shipping would continue to be conducted as in the past—under free enterprise. On November 15, the Lord President of the Council (Mr. Herbert Morrison), stated in the House of Commons :—

> It is not the intention of the Government to propose the nationalisation of the shipping industry, and we shall rely on the industry to have full regard to the public interest. The Government look with confidence to the shipping industry generally to play a full part in the effort towards national economic recovery, and are alive to the problems with which our shipping finds itself confronted as a result of the war.

In a reply to a supplementary question as to whether the decision not to nationalise shipping applied only to ocean-going shipping or would include coastwise shipping, Mr. Morrison said :—

> It applies to coastwise as well as ocean-going shipping, but it is recognised that there are relationships between coastwise shipping and inland transport to which my right hon. friend, the Minister of War Transport will, I can assure my hon. friend, give due attention.

Mr. Alfred Barnes, M.P., who had replaced Lord Leathers as Minister of War Transport, supplemented this announcement, at the same time fixing a date when shipping would be released from control :—

> The Government have decided that dry cargo ships, other than those employed in trooping or other direct military or naval service, shall be released from requisition on the termination of voyages after 2nd March, 1946, when the present charters expire. But it will be necessary, in order to secure the best use of our limited shipping resources, to keep control, in a different form, over its employment.
>
> The Government desire to restore responsibility and initiative for the operation of shipping to the shipping industry to the fullest extent practicable in the circumstances envisaged after 2nd March, but must continue to ensure that sufficient tonnage is available to lift essential imports into this country and for other purposes necessary to our economy and security. The form of control will be appropriate to a transitional period and will be relaxed as circumstances permit. No new powers will be needed. The power to control voyages by licence already exists. The Government will reserve the right to exercise the power of requisition if circumstances should require and the necessary power will remain in being.
>
> The form of control proposed will call for full co-operation by the shipping industry with my Department, and I feel sure that this will be forthcoming in the difficult period of transition just as it had been during the war. As already announced, tankers will be released from requisition as they complete their voyages after the end of this year. They will remain subject to control by licence thereafter. Passenger ships and other ships employed directly in military or naval service will remain under requisition so long as trooping and other military and naval requirements make this necessary.

Shipowners admitted that, owing to the distracted economic condition of the world, it was reasonable that the Minister should continue to direct voyages in order to meet the needs of the Ministries of Food and Supply. Within a few weeks, the rates which would be paid were published and, though they were open to criticism, the leaders of the industry admitted that they represented a reasonable mean between the payments which would have been fixed by the law of supply and demand and those which the Government, as the bulk buyer of the main supplies of the country, felt should be paid.

There remained another obscurity in the outlook—the future of the large amount of tonnage which had been built by the Governments of the United Kingdom and the United States. So far as the British ships were concerned, uncertainty was removed when it was announced that the ships would be offered to tender, a basic price being fixed by the Ministry of War Transport. Under the first scheme, owners purchased ships at a total price of just over £19½ millions, while the charter hire of those not sold was stated to be approximately £1 million a year. On these terms, in all cases higher than the basic prices fixed by the Minister, 135 ships were sold, chartered, or sub-chartered. Subsequently a second invitation was issued to the industry and met with a fair response. Whether the Government or the industry has got the better of these transactions, time alone can show, but some observers believe that, in the uncertain conditions which are likely to prevail for some time, a good many of the ships will prove expensive bargains. But the result at least shows that, in spite of their war experiences, shipowners have faith and courage.

There remained the problem created by the tonnage which was the war's legacy to the Government of the United States—no fewer than 4,570 ships. In volume, it obviously exceeded any possible expansion of trading by American shipowners to whom the Government at Washington had decided that the best of the vessels should be sold. For several months controversial debates were held on Congress on this problem. The Bill, as passed into law, assures preferential treatment of American nationals in the disposal of the tonnage. It excludes foreigners from charter privileges, and permits the sale abroad only of vessels *not* wanted for the creation of a strong post-war American merchant marine. The measure was approved in compromise form by 233 votes to 115. In defending the measure from criticism, Mr. Otis Bland, chairman of the Merchant Marine Committee, told the House of Representatives: "Britain is not asleep—our competitors are not asleep in their efforts to build up foreign trade. If we want to pay our debts, we must also build up our foreign trade. Let us not repeat the tragedy of 1918. when our merchant marine was driven off the seas."

The general features of the Act to dispose of the 4,570 ships, which cost £425,000,000, may be summarised thus:—

1. It is intended to place in reserve as "untouchable except by statute" about 2,000 ships of about 20,000,000 tons d.w. These will be nearly all of the "Liberty" (10,000-tons d.w.) type, and old cargo ships.
2. Apart from this reserve fleet, about 19,000,000 tons d.w. will be disposed of, preference being given to American ship operators, leaving only the "unwanteds" (mainly "Liberty" type tramps and older vessels) for sale to foreign owners.
3. After these deductions have been made, the United States will still own an active fleet of about 16,000,000 tons d.w.—"a post-war U.S. fleet capable of carrying at least half of America's sea-borne commerce."
4. The U.S. Maritime Commission has scheduled 31 trade routes "vital" to American traders; these will absorb 395 passenger and cargo-passenger liners, totalling 3,900,000 tons.
5. When these plans have been carried into effect, there will still be over 12,000,000 tons and these will apparently be used on less important liner routes, probably in opening new routes; in improving existing ones, and possibly in "tramping"; before the war American shipowners did not engage in tramp trading. Coastal, inter-coastal, and Great Lakes trade, which is reserved to the American flag, will account for a proportion of the war-built tonnage.

Another uncertainty in the shipping situation was removed by an announcement early in March as to the fate of what remained of the shipping of Germany, which had suffered heavy losses during the war. The Governments of the United Kingdom, the United States, and Russia decided that it should be distributed equally between them. In these circumstances, one-third of the tonnage—147 ships of 435,000 tons gross—passed to the ownership of the British Government. It was further agreed that the United Kingdom and the U.S.A. should provide out of their shares of the surrendered German merchant ships appropriate amounts for Allied states, whose merchant marines suffered heavy losses in the common cause against Germany, except that the U.S.S.R. would provide out of its share for Poland. For the purpose of dividing the German merchant marine into three initial shares, the three Governments agreed to constitute a tripartite merchant marine commission to submit to them the agreed recommendation for the allocation of specific German ships and to handle other detailed matters arising out of the agreement. Thus the future of German shipping was decided, each of the three Great Powers taking its share of the ships which were valued at about £20,000,000. It may be that the historian of the future will decide that the Allied Governments would have been well advised to scrap all the ex-enemy tonnage, leaving each country to replace its shipping losses by the construction of ships of the most modern design and the highest efficiency, embodying all the experience which had been gained during the war.

In face of all the uncertainties which existed in the early months of the peace, British shipowners placed many orders for replacement tonnage, besides arranging for the refit of ships as they were released from control by the Ministry of War Transport. The more urgent needs were those of the liner companies, anxious to resume their regular services on the main routes, and of the tanker owners who realised their responsibility to maintain oil supplies in this country, particularly in view of the serious falling-off in coal supplies. On the other hand, during the war an unprecedented number of cargo ships suitable for use as tramps had been built on both sides of the Atlantic. When the urgent post-war needs of world trade had been met, would there be too many ships afloat for the carriage of bulk cargoes under the flags of the principal maritime nations and, in that event, could adequate freights cover the cost of voyages in view of the rise in building costs and in operating expenses? Those matters were anxiously discussed by British tramp owners. It is not surprising, in the circumstances, that few contracts for tramp ships were placed. By the turn of the year, however, every available berth in all the shipyards of Britain and Northern Ireland was either occupied by, or had been assigned to, a new ship, some berths being allocated to foreign shipowners. By the end of March, when 734 naval contracts had been cancelled by the Admiralty, as events may show, with undue precipitancy, the shipbuilding industry was once more very active, providing employment for nearly a quarter of a million men. The ships building or on order were as follows:—

SHIPS FOR BRITISH OWNERS.

	Liners.*		Tramps.		Tankers.†	
District.	*No.*	*Gross tons.*	*No.*	*Gross tons.*	*No.*	*Gross tons.*
Clyde	61	479,356	8	39,160	4	33,400
Scottish Outports	17	91,530	—	—	—	—
North-East Coast	92	610,210	19	95,435	38	286,750
Rest of England	16	184,900	—	—	2	16,900
Northern Ireland	11	137,350	—	—	8	69,100
Totals	197	1,503,346	27	134,595	52	406,150

Grand Total:—276 ships of 2,044,091 tons gross.

SHIPS FOR FOREIGN OWNERS.

Miscellaneous.	Liners.		Tramps.	
Gross tons.	*No.*	*Gross tons.*	*No.*	*Gross tons.*
1 Floating Dock 1000	42	227,310	9	42,700

Total:—52 ships of 271,010 tons gross.

When the annual meeting of the Chamber of Shipping was held on February 28, a good many of the clouds had cleared away, though as the President (the Hon. Joseph Maclay) remarked, the industry was entering "a period of great perplexity" as a variety of new influences had to be taken into account. The Government having decided not to nationalise the industry, "each owner had been left with the responsibility of weighing up the position and backing his own judgment," but he expressed himself convinced that "our native wit, which during the last century had built up and maintained a great mercantile marine, would not be found wanting."

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* Included a cable ship of 8,100 tons gross.
† Included two whaling factory tankers together 30,000 tons gross.

The President suggested that there were common objectives to attain which owners could and should act together. They were as follows :—

> "That the shipping industry should continue to be conducted by private enterprise, unless and until it can be clearly demonstrated that some other system would better serve all the interests of the nation;
>
> "That we should work for and support all the efforts being made to increase world trade, and not use up all our energies in trying to parcel out the present volume;
>
> "That our costs, including shipbuilding costs, and port charges, should have relation to the circumstances under which we have to compete in the world markets;
>
> "That we aim at maintaining a mercantile marine which the youth of the country will be willing and proud to serve in.
>
> "Finally, that we should offer and accept co-operation with the Government, as and when necessary, to ensure that for peace and war, Britain's sea-faring traditions and strength are adequately maintained."

Mr. Maclay declared that the days of *laissez-faire* were gone. "We are in an era of the committee-men, and, unpleasant though that fact may be, we must recognise it." He suggested that, while admitting this, it should be one of their tasks to watch that the pendulum did not swing too far, and cause them to lose the ability to think independently for themselves, or become incapable of taking the type of risk which was required for expansion and for private enterprise. He also suggested that it would be necessary to watch that the present tendency to glorify the State as against the individual did not go too far, as it might cause people to believe that the individual existed to serve the State rather than the State existing to serve the people. "The Government have officially stated their policy towards shipping. We welcome that statement and gladly accept the responsibilities which are thereby left with us. We do so with the profound conviction that we are capable of carrying on, and that the nationalisation of shipping would not serve the best interests of the nation."

The keynote of the President's address was :—

> The continuation of private enterprise should not exclude the possibility or desirability of national planning, either by the shipowners themselves or in consultation with the Government. Planning industry on a more national basis is often looked on with suspicion by business men because they fear it must inevitably lead to nationalisation. As a nation, I think it will be imperative for our industries to work in constant co-operation with our Government. There may be times when we will require assistance during the coming years. It depends on the actions of other nations. The assistance need not necessarily be in the form of subsidies.
>
> The point I am anxious to make is that we should be able freely to discuss such matters among ourselves and with the Government, without the constant fear that such talk increases the threat of nationalisation.

In discussing international co-operation, Mr. Maclay remarked that they would have to watch that such schemes of co-operation were not merely a means by which other nations would try to obtain a larger share of our trade.

> British shipowners are willing to co-operate with other maritime countries on many subjects, but we must regard with disfavour and caution anything which threatens to hinder us regaining our pre-war position, and expanding beyond that as far as fair competition permits. It will be folly for British shipowners to offer co-operation on any basis which shackles our ability to expand.

In the following month, when the shipbuilding movement was well under way, the First Lord of the Admiralty (Mr. A. V. Alexander) sprang a surprise on the maritime industries when presenting the Navy Estimates to the House of Commons. During the war licences had been issued by a Government committee, consisting of experts, for the building of ships. The First Lord revealed that "on the recommendation of the Minister of War Transport, the Government had decided to set up a new body of a larger and more representative membership and with wider terms of reference. It would have an independent chairman, representatives of the Admiralty, the Ministry of War Transport, and the Ministry of Labour, together with representatives of the shipbuilding industry, the shipbuilding trade unions, shipowners, and the officers' and seamen's unions of the Merchant Navy, " to advise the Government on all matters affecting the efficiency and stability of the industry, to advise on any steps required to safeguard the war potential of the industry, to promote the co-operation of shipbuilding employers both with shipowners and the representatives of shipyard labour, and to advise on organisation, practice and cognate matters with a view to maintaining and improving the efficiency and stability of the industry."

He explained that Ministers believed that this committee would play a valuable part in one of the most important fields of the national economy by contributing to the prosperity and stability of the industry. They also believed that the committee would make a great contribution to the welfare of the many thousands of workers engaged in the industry. He added that these workers had done "a splendid job during the war," turning out a tremendous volume of shipbuilding and ship repairs, and maintaining the traditional high quality of British workmanship, often in difficult and dangerous conditions, for the shipyards were among the main objects of the enemy's air attacks. "One war is over," and the First Lord remarked that the country "had now to fight for the recovery of our standard of living." This could be done in one way only, "by continuing the hard, steady labours which enabled us to overcome our enemies in the war and which are now required in no less measure if we are to enjoy any of the fruits of peace."

Commenting on the setting up of this new committee, *The Shipping World* remarked that, so far as the shipbuilding industry had lacked stability in the past, that had been due, first, to Nature, which controlled harvest yields throughout the world; secondly, to subsidies and other forms of flag discrimination adopted by foreign governments; and, thirdly, to the Admiralty. Under no system of planning could the first two handicaps be removed, nor was there much hope that the new committee could improve Admiralty practice, which was dictated by Parliament and, in particular, by the Chancellor of the Exchequer.

In years of peace the needs of the Royal Navy are seldom adequately met, and restricted orders are placed with the shipyards which, in order to provide full employment, should be able to rely on the naval authorities for a steady flow of orders representing about 25 per cent. of their work. When there is a threat of war, large contracts are placed for men-of-war of all types, and it is claimed that they must have priority over all other orders. Thus it came about that when the clouds began to gather in the late 30's, the whole balance of work in the shipbuilding industry had to be suddenly changed. When it is recalled that an order for a battleship results in sub-contractors in 60 towns being called upon, the wide-spread effect of "a naval boom" or "a naval slump" will be realised.

What, in fact, happens? As soon as a war comes to an end, the Admiralty cancels its contracts. In the years following the First World War, the strength of the Royal Navy was reduced by 75 per cent. and few new men-of-war of any type were ordered, with consequent unemployment of men and plant, the former being left to walk the streets in idleness while the latter became a source not of profit but of loss. As soon as

Germany had surrendered in the recent war, 727 contracts were cancelled, and the First Lord indicated that no new contracts would be placed at present.

It is obvious from this record of the reactions of the Government, shipowners and shipbuilders to the conclusion of the war, that the outlook for the maritime industries is still overcast. The prosperity of shipping depends on the prosperity of world trade and no one can prophesy when the trading nations of the world will abandon narrow nationalistic policies and devote themselves to the task of laying the foundations of peace by co-operating in building up international commerce, so that merchant ships may have cargoes to carry. Shipowners, and still less shipbuilders, cannot exercise any control over the current of world politics, otherwise the nations of the world would have come nearer to freedom of trade than they have so far done.

The British shipping industry, whatever its fears, is preparing for a resumption of world trade and is willing and, indeed, anxious to co-operate with the owners under other flags to ensure that the tonnage available shall be adequate to any demands which may be made upon it and that the various merchant fleets shall be used to the utmost advantage of producers and consumers. In discussing the subject of international co-operation, the report of the Chamber of Shipping for 1945–46 recorded that the machinery existed in the Liner Conferences, the International Tanker Owners' Association and the International Shipping Conference which, with some necessary adjustments, were well suited to take care of the problems which would confront the industry. It recalled that the General Council of British Shipping, " the House of Lords of the industry," as it may be called, had announced last year its intention to call a meeting of the International Shipping Conference " as soon as the Allied Governments have declared their policy regarding surplus war-built ships " and conditions had been advanced to a point which would make such a meeting fruitful. That time did not yet appear to have arrived, but " it is obviously approaching, and at the right moment the machinery will be put into operation."

The Chamber of Shipping emphasised that the International Shipping Conference had never sought, and was not designed, to interfere with Liner Conferences or Tanker matters in settling (whether nationally or internationally), questions of freights, or tonnage, or sailings. In the tramp sphere, on the other hand, where no Conference machinery existed, it was found before the war that the International Shipping Conference offered a convenient method of international self-regulation by means of such agreements as minimum freight schemes.

The nation owes a debt of gratitude to British shipowners as well as to officers and men. Without British shipping and British seamen, victory over the Axis Powers could not have been won. During the period which elapsed between the military triumph of Germany in over-running practically the whole of the Continent of Europe and the declaration of war by the United States at the end of 1941, the burden of maintaining sea communications rested on British seapower, the merchant ships provided by free enterprise, guarded by the Royal Navy, with the co-operation of aircraft. If British sea-air power had fallen short of the demands upon it in that emergency, nothing else would have been of any avail. The mobilisation of troops by the freedom-loving nations, the rapid expansion of air strength, the reinforcement of the weak and greatly overworked naval forces under the White Ensign, and the output of munitions would have been useless. In the last analysis, everything depended on merchant ships for the carriage over the seas of troops and all they required in order to fight in the various widely separated theatres of war.

The record of the history of this island country is that, in peace as in war, it must have adequate fleets of merchant ships, forming a well-balanced mercantile marine, if it is to survive and those ships must be assured as safe passage as can be secured in face of any enemy, however strong and resourceful, a matter of adequate sea-air power. If that lesson of the last war, and of all former wars, is not taken to heart, all hope of the future of the British peoples throughout the world must be abandoned. There was no escape from that conclusion, whatever may be the eventual development of air power as a means of transport and whatever may be the result of the appearance of the atomic bomb with its terrible possibilities. As to air transport, a cargo ship of moderate size can, in peace conditions, carry three times as much freight, measured in ton-miles, as the whole of the highly organised domestic air lines of the United States; the cost per ton-mile is about 30*d.* by air, while the cost for the ship before the war was about one-thirtieth of a penny. Air transport, when organised on a great scale, may become cheaper than it is at present and the sea freights may be increased owing to the higher cost of building and operation, but, to the limit of vision, the carriage of goods by sea will be much cheaper than by air, while the ship can offer amenities to passengers, whether on business or pleasure, which the aeroplane cannot provide.

The seas will continue to be the main highways of the British peoples, in the homeland, in the Dominions and in the Colonies and Dependencies, and if they were no longer able to use the seas freely, their doom would be sealed. For that reason, the restoration of the merchant fleets of this country is an essential and urgent task.

ARCHIBALD HURD.

CHAPTER V.

THE AIR WAR AT SEA.

The final stages of the air war at sea differed from the earlier stages partly in that they embraced the great Allied carrying operations and were therefore mainly concerned with the clearing of sea ways and the protection of shipping. Until victory in Europe was secure and the instrument of surrender had been signed in May, 1945, the main responsibility of all aircraft which operated over water, was to secure the flow of men and supplies. In the Pacific a rather similar condition prevailed, for although the atomic bombing overshadowed all else in that theatre, the air-sea war was, in fact, waged right to the end. And there, as in Europe, there was, in the final stages, a transfer of emphasis from strike operations to carrying operations.

It is as important to recognise this transference of the air-sea effort from striking to carrying during the final stages of the war, as it is to take into account the use of atomic bombs if useful inferences are to be drawn. It is the intention here to depart somewhat from the practice of previous editions of " Brassey's Naval Annual," and instead of devoting the whole of this article to a review of the air war at sea during 1945 to refer comparatively briefly to this subject, in order to complete the series, and then to turn to these wider inferences and to the indications which are given when the air war at sea is surveyed, as it were, from a greater distance and in perspective. In this way the two great features of the war, the development of naval aviation and the employment of the atomic bomb, may be seen in relation to plans for the future. First the air war at sea during 1945 will be recalled as briefly as is consistent with mention of a selection of events of special interest.

It has already been said that carrying operations predominated and this was true of almost the whole of the last year's work. The fighting that took place on land brought into being intensive tactical employment of aircraft of all kinds ; but the war at sea concentrated all aircraft upon carrying and convoy protection. At the crossing of the Rhine, in March, 40,000 airborne troops were landed in two hours. Aircraft were, in such operations, carrying on the responsibilities traditionally assigned to ships. They were carrying troops across water and land and bringing them almost to the scene of battle. In some instances they were landing troops at the scene of battle and then they were subsequently supplying them. Here it will be noted that aircraft were indeed doing some of the work which in the past was done only by ships ; but they were not being used in a manner to support the theories of those early enthusiasts who claimed that the aircraft would oust the ship for such duties. For as aircraft were being used for conveying troops and supplies to the field of battle, so the demands for heavy equipment on the field of battle multiplied and the carrying done by ships increased. The student of the air war at sea, therefore, looks all the time during those last tremendous months in France and Germany, to the sea crossing and to the activities that were in progress there. The developments that had resulted from the Battle of the Atlantic and from the war at sea in general, were being turned to a special purpose during the final phases of the war on land.

Those taking a general view of the fighting that took place from the time the Germans had been forced back to the German frontier, in January of 1945, to the time of the unconditional surrender in May, must see it as the ultimate point of the collaborative use of the three Services. It is possible to divide up the war into phases according to whether the main fighting took place on the sea, on the land, or in the air ; but such divisions are artificial. When there was intense land fighting, there was the background of supply which had to be taken care of by superiority at sea. When there was intense fighting at sea there was a background of repair and replenishment from the land, and when there was intense fighting in the air there was a background of both land and sea. The relationship between strategically well-placed aerodromes and the effectiveness of air forces was learned early in the war. Although, therefore, it is not possible when reviewing the final year of the fighting in Europe, to pick out any great air-sea events comparable with those that were picked out for consideration in earlier years, there was throughout the background of air-sea collaboration without which the armies on the land could not have moved. It sounds almost absurd to emphasise such a point now ; yet it is only necessary to scan the military writings of six or seven years ago to realise that the point was only appreciated as a result of the experience of war.

In the Pacific the emphasis was more clearly upon the combined use of all three Services than in Europe. The advance upon Japan which preceded the use of the atomic bomb was amphibious. In February Manila was entered and by July the liberation of the Philippines had been completed. But in the meantime the United States and the Royal Australian navies had continued to advance upon Japan itself. The Honshu attack of February employed a large force of ship-borne aircraft and so did the attack on Formosa in March. In the Okinawa operation it was the responsibility of the British Pacific Fleet to deal with the aerodromes and to prevent enemy aircraft from interfering with the American task force. It was when the Japanese attempted to stem the advance that air attack succeeded in sinking the battleship Yamato. Thus the stage was set, by means of a sequence of amphibious operations, for the dropping of the first atomic bomb on Hiroshima on August 6. The second atomic bomb was dropped on Nagasaki on August 9, and on August 14 Japan surrendered.

It is now possible to turn to the more general survey of the war developments. The Pacific war was notable for the way in which it stimulated the employment of aircraft carriers. Aircraft carriers were dominant in many of the actions. Progress in their design, equipment, and operation was greatly accelerated by experiences in the Pacific. In fact the lesson of the war in the Pacific was that the aircraft carrier, instead of being near the end of its useful life, was only at the beginning of it. This lesson would have remained firm had it not been for the coming of the atomic bomb. There can be no doubt that the successful production of this kind of bomb casts doubt upon most of the direct inferences that can be drawn from the war.

That is the great problem of the present time : that a large amount of military experience was bought at an enormous cost during the war and that just at the end of the war a new weapon arrived which was of such power that it affected all foregoing lessons. Before the attack on Hiroshima on August 6, the lessons of the Pacific war were plain for all to see. They emphasised the indivisibility of the three Services; they emphasised that three Services working in really close collaboration are more powerful than the sum of their individual strengths; they emphasised that aircraft can be made more effective in a war waged over great distances if as many of them as possible can be given mobile bases.

But that last and most fundamental lesson, as it seemed at the time, is disturbed by the coming of the atomic bomb. The aircraft carrier bases its value on the fact that it is a mobile base and that in consequence it allows aircraft to operate at higher battleworthiness. That is to say it enables aircraft to go into action, stripped for action, not lugging round with them hundreds of pounds of fuel which is of no value in the combat, but which must be carried in order that they may be able, if they win, to return to base.

Here is the foundation of the value of the aircraft carrier. It sends up an aircraft, be it fighter or bomber, with a minimum fuel load. In consequence that aircraft can carry either heavier arms or else it can enjoy the advantages of improved performance. Theoretically one ounce of petrol more or less, reduces or increases the air performance in speed and climb of that aircraft. And in actual fact the petrol load does affect performance. The aircraft working at long range is—other things being equal—always less effective in combat than the aircraft working at short range. It follows that if the aerodrome can be moved about so that the aircraft take off fairly near the scene of battle they will enjoy a notable advantage. The aircraft carrier does just that. Its fighter is stripped for combat, carrying as little dead load as possible. Its bomber is using as much of its lift as possible for lifting bombs—not petrol to get it home.

All this was known and was the basis of the large carrier programme launched by the progressive navies. The Midway Island battle of June, 1942, rubbed in the point. The Solomons battle of April, 1943, taught the same lesson, and there were hosts of other examples which all tended to make the lesson look as if it were a permanent one. It seemed to say that the aircraft carrier was one of the kinds of ship that had a long period of intensive development before it.

How is this conclusion affected by the coming of the atomic bomb? The answer is first that the atomic bomb is not heavy. A large bomber was used to launch the atomic bombs that were dropped on Japan; but a small bomber could have carried them. Moreover the atomic bomb could be made as the war-head of a rocket. And General Arnold has said that the means are already in sight for increasing the range of rockets to 1,000 miles and more. And as the speed of rockets and the height to which they go are both so great, the difficulties of interception are correspondingly greater.

Surveys intended to sort out these matters must have an enormous scope and range. It appears that the main tendency is for striking weapons to change drastically; but for carrying vehicles to change more slowly. It appears to me that in this differential in the rates of change there lies the secret to future weapon policy.

Let it be supposed that the atomic bomb is so developed, and with it the rocket, that strikes can be conducted at great ranges and with all the explosive power needed to destroy large areas. Then it will follow that the ordinary bombing aircraft would play a negligible rôle if there were another war. The means of striking at the enemy would be the rocket with atomic war head. The bomber could justify its existence only on the grounds that there might be some targets which one side would want to destroy while leaving contiguous buildings or installations undamaged.

For this kind of precision bombing it must be supposed, the atomic bomb would be unsuitable. The " old fashioned " high-explosive bomb would be needed and could then be employed in precision raids on specific buildings such as headquarters, without doing great damage to places round about. But even if in this way the case for the continued development of the ordinary, manned bombing aircraft can be established, the development must be on a small scale compared with past efforts. The future effort must be devoted mainly to the atomic bomb and to guided missiles capable of carrying it. For the defence developments affect the position.

Radar-controlled anti-aircraft fire became so effective during the latter part of the war that hits were being secured in an exceptionally high percentage of rounds fired. The position was being reached when the anti-aircraft gun, fully automatic in its operations, was putting up a barrier to enemy aircraft which those aircraft found it difficult to penetrate. And the Germans were looking even farther ahead in the methods of interception they were developing. They were devising radio-controlled " destroyers " which could be shot up to great heights for engaging bombers. In short, the picture seemed to show that the bomber would find it increasingly difficult to penetrate the defences. At first sight it might seem that this was a departure from all past experience, wherein offence and defence were in the main in balance, the scales tipping slightly to one side or the other for brief periods. Yet it is not true to say that because the defences were getting the better of the bomber towards the end of the war, that the balance between offence and defence had been permanently upset. For offence was on the point of changing to the guided missile. The Germans had seized the need for making this change earlier than the Allies. Their flying bomb was the first step, their V-2 rocket the second. They had accepted it that the manned bomber had met its match in the newest defence systems, and they were switching to the guided missile. But the first kind, the flying bomb, proved in the end to be as vulnerable as the bomber to the defences. It was their second effort, the V-2, that had the greater significance.

For during the war no effective means of countering the rocket assault was found. Owing to the extremely high speeds of the rocket weapon and to the great heights to which it ascends in its trajectory, it is difficult to find any means of dealing with it. Means of some kind will be found no doubt ; but it may confidently be expected that the balance between defence and offence will, as in the past, swing a little this way and that, but never tip finally and completely in either direction. So the rocket with atomic war-head will get through. Means may be found for destroying some rockets before they reach their targets ; but not many would have to arrive for the destruction to be massive.

The method of striking at an enemy, therefore, has undergone fundamental change. There will be a leaning towards massive destruction as opposed to the attack upon precisely defined targets. And the atomic bombs will be conveyed not by manned aircraft, but by guided missiles working at speeds far in excess of the speed of sound and attaining heights of perhaps 80 or 100 miles above the earth at the peak of their flight. If this prediction be correct, the need for a large number of aircraft disappears. That applies whether the aircraft are land-based or ship-borne. They will not be required. The strike of the future will be massive and will not be selective. Instead of choosing a precise target and then selecting the precise weapon which fits that target—torpedo, bomb, rocket, or other—the whole of a large area in which the target may be found will be wiped out. With the passing of the bomber and of the torpedo-carrying aircraft, there must also be the passing of the interceptor fighter. And even if the change is gradual, it must affect both the bomber and the interceptor fighter simultaneously.

The question now arises as to what use aircraft of the ordinary kind would be if there were to be another war. They would not be used for striking which, in the past has been their chief duty. And if they are not used for striking they will not be used for the ordinary kind of bomber interception. At first glance it looks as if the aircraft, which dominated the war just over, will now be in the decline. And it is most doubtful if it will ever dominate another war.

But that is not to say that its period of usefulness in war is over. Aircraft have been undergoing rapid technical development. Speeds have been rising and the introduction of the turbo-jet—or gas turbine driving the aircraft by means of the reaction from a jet of hot gases—has given promise for improved all round performance in all types of machine. Already jet aircraft have been worked successfully from aircraft carriers. The de Havilland Vampire, twin-boom jet-driven fighter, has been operated from a carrier with complete success, which means that the carrier of the future, if it still carries fighters, would be able to launch aircraft capable of speeds of 600 miles an hour and more. And with bombers also the coming of the turbo-jet will step up performance very markedly. They will be able to cruise at speeds of perhaps double those at which they were able to cruise in the war against Germany. They will be able to operate at greater heights.

All this performance improvement will not, I think, be thrown away. In order to find out where it will find its outlet we must return once more to the fundamentals. The striking which is the first stage of any offensive has been dealt with. It will be done by guided missiles and not by manned aircraft. And rocket drive is more likely to be used for these missiles than ordinary jet drive. The rocket drive takes its own oxygen with it and so can work at greater heights than ordinary jet drive where the gas turbine takes in its oxygen from the air.

But wars are not won by striking, however massive the destruction wrought. Striking is only the first stage. There must always be the ultimate stage of occupation. It is in considering the means of achieving occupation that we come back to the carrying vehicles; to the ships and the aircraft. To wreck a city and so to destroy the ground on which it stood as to sterilise it, is not victory in any sense accepted now or likely to be accepted in the future. Victory is when that ground is taken over and made fruitful by or partly for the benefit of the victors. In other words occupation is not only the outcome of victory, it is the purpose of war. And for occupation there must be the whole process of carrying.

We come, therefore, to the central fact that the final stages of the war, which were carrying operations, emphasise the real purpose of all wars and act as a reminder that whatever the weapons that may be used, there must come a stage when vast numbers of men and huge quantities of equipment must be moved from one place to another and must be safely landed at that new place and then fed and supplied while they remain there.

Apart from striking, therefore, there is still, and is always likely to be, carrying. Carrying has so far been done by a combination of land, sea, and air vehicles, and there is nothing to suggest that any drastic change will come. I believe that aircraft will be able in the future to take over increased carrying responsibilities; but I do not think that they will oust other methods of carrying. It follows that the operations in any future war which had to do with carrying would employ ships and transport aircraft. The aircraft would probably be much faster than the existing ones and they would probably be much bigger. They would fly higher and their rate of climb with full load would be better. But they would essentially be transport aircraft. There would likewise be transport ships, ships devoted to the carriage of men and supplies. Whether there would be aircraft carriers is more difficult to say. It may be that if there were another world war, there would be no place for the aircraft carrier. It would not be needed for the combat duties it performed in the recent war, and it would be unsuitable for aiding in any of the carrying duties. That applies to a world war.

Now something must be said about smaller kinds of war and about what used to be called punitive expeditions, which are really wars in which one side has a preponderance of modern weapons and trained men. When these smaller operations are considered, either as small wars on their own or as parts of another world war, certain limitations of the atomic bomb become clear. The atomic bomb, for instance would not have been much use in Java. It can hardly ever be used where there is an element of police work, and in consequence it would not be of great value to the kind of international air force which some enthusiasts have advocated. For these smaller operations there is still the need for the weapon that can strike relatively small blows with great accuracy and for the carrier of small size which has a high degree of flexibility.

In a major war one might divide up the appropriate air force into guided missiles for launching atomic bombs, and high-speed, large transport for conveying the occupying troops to the places that have been prepared by the launching of atomic bombs. In a minor war, or in individual operations which might accompany a major war, such simplification is not possible. And we are thrown back upon the kind of Service structure which was seen in the war against Germany and against Japan.

Restless spirits, when they see a new thing, are inclined to be impatient with those who argue that some care and circumspection should be exercised before drastic changes are made in Service structure and in Service equipment. These restless spirits shout that the atomic bomb has made both navies and air forces obsolete. They argue that it is a waste of time to continue developing any kind of bomber or fighter or any kind of fighting ship. But they take no count of the carrying which, I have argued, is an essential part of any military operation that is brought to full success, and they take no count of the fringe operations that may accompany a major war.

It may be true that the heavy bomber as we knew it in the war of 1939–45 is obsolete and that no further development effort should be devoted to it. That is a position which can be supported by logical argument. But that there are kinds of bomber that must still be developed is certain. And if there are kinds of bomber, there must also be kinds of fighter. And if there are bombers and fighters there must also be military transports. No matter, then, how tremendous the power of the newer atomic bombs may prove to be; no matter what the results of the trials which—at the time of writing—have been arranged to take place in the Pacific; some work must be continued on more or less classic types of aircraft. And it may not be too great a leap from this point to the other point that there should also be continued development of aircraft carriers.

The purpose of ship-borne aircraft will have been altered. There may be no further Midway Island actions. In that action the aircraft bore the brunt, the opposing fleets not coming within sight of each other, and the United States lost 35 out of 41 torpedo carriers. But although that kind of major fleet action may not again be repeated—for it would lead to the use of the most massive weapons available and they would certainly include atomic bombs of some kind—there must still be visualised some kinds of air-sea action.

Wars and active service operations do not readily fit themselves into simple compartments. The major war cannot be distinguished from the minor war by simple rule. And the consequence is that the atomic bomb and its associated devices cannot be said to have a special, limited, and clearly defined field while the ordinary manned aircraft has another equally clearly defined field. For those upon whom falls the responsibility of leading this country aright in the matter of weapon policy and the structure of the fighting services, it is of the utmost importance that there should be no delay in development work. And that in turn means that development work along lines already chosen must, with few exceptions, be continued. The heavy bomber and the interceptor designed expressly for dealing with heavy bombers are the only types about whose future there seems sufficiently certain indication to enable them to be dispensed with. But the transport aircraft should be developed at top speed and with it some specialised form of interceptor capable of dealing with transport aircraft. And if it is decided to complete the circle there would also be the need to develop aircraft capable of escorting the transport aircraft. Meanwhile the development of the smaller aircraft of many different types must be continued and the fullest use made of the new technical developments in the form of the navigational devices and the employment of turbo-jet power units.

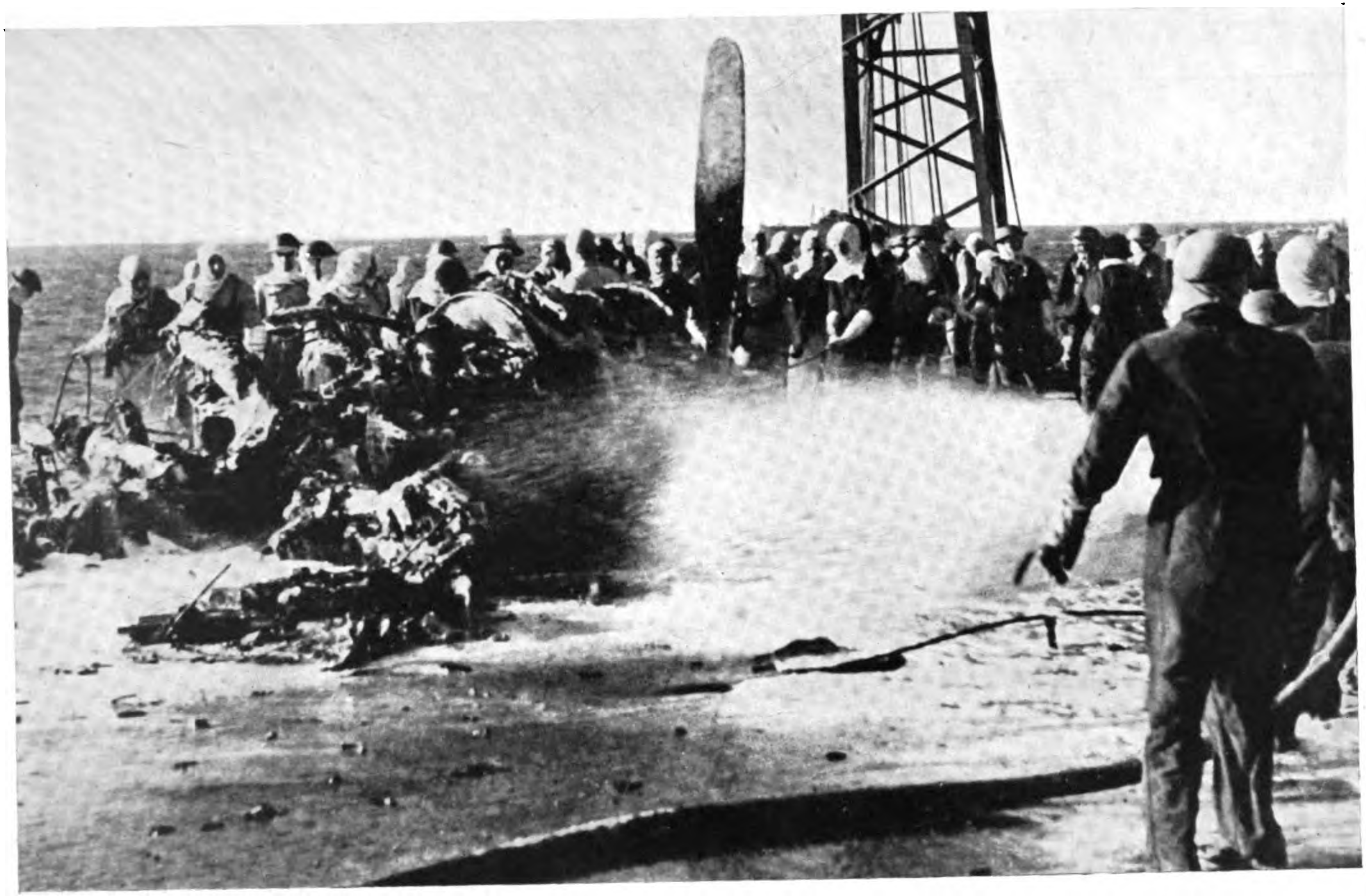
Let the inferences to be drawn from the war of 1939–45 be summed up in this way: the operations of the war laid emphasis throughout upon the interdependence of the three Services; they enabled especially large strides to be taken in the development of the design and use of ship-borne aircraft and of aircraft carriers; they showed that carrying must in the future form a large part of the aviation side of any operation. That was the first set of inferences. All of them lead to the stressing of collaboration and of the employment to the full of the advantages of the mobile base for improving the performance in combat of aircraft of all types.

The second set of inferences were all the result of the successful employment of the atomic bomb against Japan, and of the development by the Germans of guided missiles, especially of the rocket type, which are hard if not impossible to intercept. This set of inferences indicates that the ordinary heavy bomber has had its day and that major blows will be struck by guided missiles with atomic war heads. Therefore the weapons appropriate to major war will be these guided missiles and the apparatus of transport and supply which will provide the necessary sequel to the destruction of any part.

There are even wider problems to be faced. For instance the very nature of the atomic bomb makes it better suited for use against countries with high population densities, large industrial and built-up areas. Against primarily agricultural communities it would obviously be far less effective. If Great Britain were ever to take the offensive she would be at a disadvantage in comparison with any other country in the world if the atomic bomb were the main weapon. It follows that Britain's defences against the atomic bomb, launched by rocket, are more vital to her future existence than to the future existence of any other country.

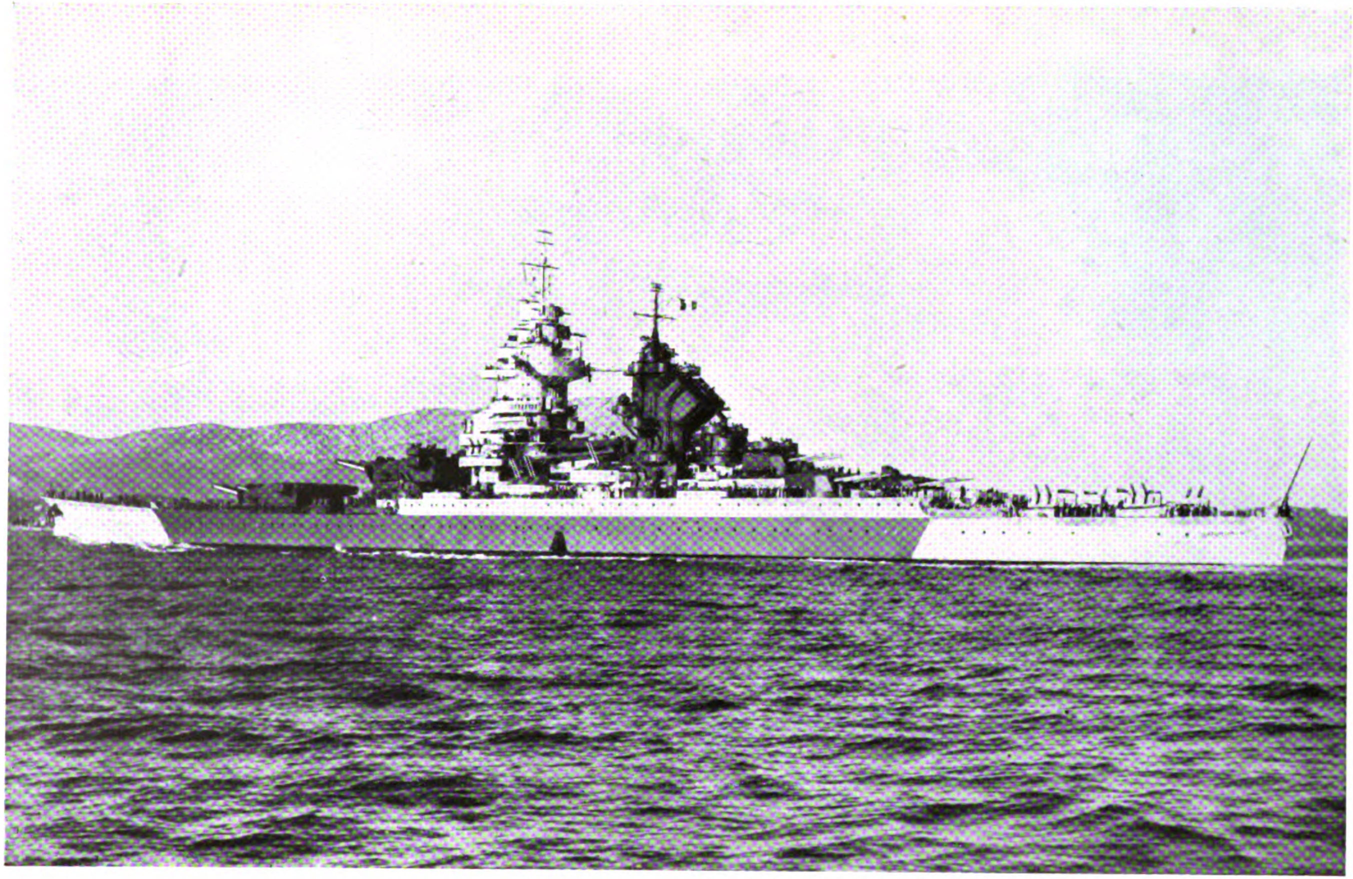
But these are wider speculations. Enough has been said to show the complexity of the problems which now face those charged with shaping weapon policy. Let us look carefully and clearly at the new weapons; but let us not forget the special demands of carrying or neglect to continue the appropriate development of the old weapons.

OLIVER STEWART.



Wreckage of *kamikaze* bomber on the flight deck of a British Carrier.

(British official photograph. Crown copyright reserved.)



French battleship Richelieu, after reconstruction.

(Official photograph, by courtesy of French Navy.)

CHAPTER VI.

THE FRENCH NAVY AFTER THE WAR.

It is not within the scope of this chapter to state in detail the part played by the French Navy during the war, but only to indicate its present situation and what it has done since V-Day.

We shall examine successively :—

The Fleet ;
The Personnel ;
The Naval Air Service ;
The new organisation of the French High Military Command and its consequences on the organisation of the Navy ;
The activities of the French Navy since V-Day.

THE FLEET.

SITUATION AT THE OUTBREAK OF WAR.

The French warships in commission when the war broke out were distributed as follows :—

7 Capital ships : 2 modern, 3 reconstructed, 2 obsolete used as training ships.
7 Heavy cruisers (10,000 tons).
12 Medium cruisers (6/8,000 tons).
32 *Contre-torpilleurs*, according to French classification, or "light cruisers" according to the Treaty of London's classification (2,200/2,900 tons).
38 Destroyers (26/1,350 tons, 12/610 tons).
77 Submarines (among them the Surcouf, then the largest submarine in the world).
2 Aircraft and seaplane carriers.
37 Sloops, escort vessels, and minesweeping *Avisos*.
A substantial fleet of auxiliary vessels : fleet tankers, fleet tenders, surveying vessels, etc.

The following ships were being built :—

4 Capital ships (35,000 tons).
2 Fleet carriers (18,000 tons).
3 Medium cruisers (8,000 tons).
4 Light cruisers (2,900 tons).
26 Destroyers (12/1,772 tons, 14/994 tons).
25 Submarines.
53 Submarine chasers and M.T.B.s.
9 Fleet tankers.

But in addition, by the end of 1939, orders had been placed for :—

14 Submarines (2/1,600 tons, 14/800 tons).
20 Escort vessels, 12 of which were Corvettes of British design, 4 of these being built in England.

When the Armistice of Compiègne was signed in June, 1940, the following ships had been completed :—

1 Destroyer (Le Hardi, 1,772 tons).

1 Submarine (Aurore, 800 tons).
16 Escort vessels (1 colonial sloop, La Grandière, and 15 Élan-Chevreuil, excellent little ships of 600 tons and 20 knots, Diesel-driven).

Eight patrol trawlers had been transferred by the British Navy, and 6 had been purchased in U.S.A.; a great number of auxiliary cruisers, patrol vessels, and minesweepers had also been commissioned.

Two battleships (Richelieu and Jean Bart, the latter uncompleted) and 5 large destroyers, nearing completion or already running trials, were also able to escape from French ports and reach North African ports. All other vessels, then being built, were either scuttled (Channel and Atlantic shipyards) or their construction was stopped (Mediterranean shipyards), except that of four escort vessels (Chevreuil type) ordered from the Chantiers de Provence, at Port de Bouc, near Marseilles. Three of these were launched in 1942 before the Allied landings in French North Africa and the total occupation of France by the German army.

Between 1941 and 1945, and in accordance with the Lend-Lease or Mutual-Aid agreements, more than 200 vessels were transferred to the French naval forces, including :—

1 American-built escort carriers (Dixmude, ex-H.M.S. Biter).
1 Hunt class destroyer (La Combattante).
3 British-built submarines (U- and V-types).
1 ex-Italian submarine, captured by the British Navy (Bronzo).
6 American-built "escort destroyers" (sisters to the British "Captain class" frigates).
6 British-built River class frigates.
7 British-built corvettes.
32 American-built P.C. escort vessels.
50 American-built S.C. submarine chasers.
7 Canadian-built submarine chasers (Fairmile type).
28 British-built harbour defence motor launches.
30 American-built minesweepers (Y.M.S.).
22 British-built minesweepers (M.M.S.).
8 British-built M.T.B's.
3 American-built boom-defence vessels.
5 American-built small tankers.
Various auxiliary vessels (tugs, etc.).

THE FRENCH NAVY WAR LOSSES.

The French Navy sustained, between September, 1939 and May, 1945, a greater percentage of war losses than any other Allied navies; these losses are given in the following table :—

	From War operations.	Scuttled.*	Total.
Capital ships	1	3	4
Heavy cruisers	—	4	4
Medium cruisers	3	3	6
Contre-torpilleurs	9	17	26
Destroyers	16	16	32
Submarines	24	29	53
Sloops and escort vessels ..	9	13	22
Corvettes	3	—	3
Submarine chasers	7	6	13
Auxil. patrol vessels	18	4	22
Auxil. minesweepers	35	10	45

* Scuttled in French ports in June, 1940, in North Africa and Toulon (November, 1942), in Indo-China (March, 1945), excluding ships on the slips, but including vessels recuperated by the Germans and Italians after November, 1942, and definitely lost since.

The total displacement of the ships lost amounts to 457,000 tons, against 700,000 tons of ships, including auxiliary vessels, commissioned in 1939.

THE FRENCH FLEET IN 1946.

Since the end of the war a certain number of old ships, or those worn out by the war, have been discarded, and several vessels (8 M.T.B.s and 4 submarine chasers) transferred during the hostilities were returned to the British Navy. The present composition of the French fleet, including (*a*) a British-built light aircraft carrier loaned for five years, (*b*) eight ex-German destroyers allocated to France, (*c*) four ex-German M.T.B.s, which were running trials near Paris when France's capital was liberated, and which were captured, is as follows :—

2 Capital ships (Richelieu and Lorraine).
1 Light aircraft carrier (14,000 tons).
1 Aircraft transport (Béarn).
1 Escort carrier (Dixmude).
3 Heavy cruisers (Duquesne, Tourville, Suffren).
6 Medium cruisers (three Gloire, Emile Bertin, Duguay Trouin, Jeanne d'Arc).
4 Light cruisers (Le Fantasque, Le Malin, Le Terrible, Le Triomphant).
24 Destroyers (8 ex-German, 9 Simoun, 5 Malpomène, 1 Tigre, 1 Albatros, six of them being large craft of over 3,000 tons full-load displacement).
19 Submarines.
12 Frigates (6 ex-American, 6 ex-British).
46 Colonial sloops and escort vessels (including 30 ex-American P.C.).
7 Corvettes.
66 Submarine chasers.
52 Minesweepers (ex-American Y.M.S. and British M.M.S.).
4 M.T.B.s and 4 gunboats for the Rhine flotilla.
28 Harbour defence motor launches.
A number of fleet tankers, fleet tenders, and other auxiliary vessels, etc.

The total tonnage of this fleet amounts to 381,600 tons, 63,000 tons of which are over-age (335,000 tons of ships over 600 tons, 46,600 tons of ships under 600 tons).

Financial difficulties have, however, compelled the French naval authorities to lay up provisionally a number of flotilla craft.

The Richelieu, the Béarn, the three Gloires, the Emile Bertin, and the four Le Fantasques have been extensively reconstructed in U.S.A. (1943–44) and, more recently, at Toulon (1945). They were given during their refits modern anti-aircraft armament and radar equipment, and are now as up-to-date as any similar contemporary foreign vessel. While the Richelieu is considered one of the most successful battleships ever built, the Gloire, the Emile Bertin, and the Fantasque are justly recorded as second to none. All of them are well-armed and fast ships, and it will be remembered that there has never been a faster light cruiser division in the Mediterranean Allied Fleet than the famous 10th cruiser squadron, which included three of the Fantasque class. These vessels performed remarkable sweeps in the Adriatic or the Ægean Sea (three enemy convoys and their escorts destroyed), and they are still able to steam a continuous 37 knots under war load displacement.

The three heavy cruisers were also refitted in France, but on a lesser scale (1945). Considering their age they cannot be compared with modern cruisers, but are still useful vessels for training duties. They are actually acting as fast transports between France and Indo-China.

Among the destroyers, the ex-German vessels which include four large *contre-torpilleurs* with a full-load displacement of well over 3,000 tons, armed either with 5·9-inch or 5-inch guns, four smaller torpedo boats (two 1,100 tons and two 600 tons) and the Tigre, which has been thoroughly refitted in France (1944–45), are the most efficient ships, while the Albatros, only surviving vessel of 18 sister ships which underwent severe damage in Morocco (November, 1942), is at present laid up, pending repairs and modernisation.

Several submarines were also extensively repaired in U.S.A. in 1943–44 (Archimède and Amazone class).

Considering the present unsatisfactory financial situation of France, the absolute necessity of reducing the military expenses and the immense damage inflicted to her shipyards and heavy industries, it is doubtful if a large programme of new naval construction can be undertaken for several years to come. It may be hoped, however, that an exception will be made for one or two heavy fleet carriers, so that efficient " task forces " can be organised with the Richelieu, and the Jean Bart when completed. To some extent, the loan of a British carrier to the French Navy makes up for the lack of this class of vessels, without which no modern navy can be complete. French public opinion has fully appreciated the kind offer of the British Admiralty, thanks to which the excellent air crews of the French naval air service will be able to be trained until their own new ships are completed.

There are, however, some new ships being built. Except for the Jean Bart, they are vessels which were abandoned on the slips in June, 1940, and which were not scuttled by the Germans in May, 1945, or remained undamaged despite the severe Allied bombardments sustained by the French shipyards and navy yards. Only the vessels which are already well advanced and the material of which has been salved will be completed; they include :—

1 Medium cruiser of 8,000 tons (De Grasse, building at Lorient).
4 Second-class submarines (800 tons), two of which were launched on May 3 (Créole at Hâvre) and May 4 (Astrée at Nantes).
4 Fleet minesweepers and escort vessels: Bisson, Commandant Ducuing, Commandant Amyot d'Inville, Commandant de Pimodan, building one at Lorient, two at Nantes-St. Naziare, one at Bordeaux; two are already launched.
2 Colonial and surveying sloops: Beautemps-Baupré and Lapérouse, diesel-driven vessels of 1,372 tons and 18 knots which were started as light aircraft tenders and were originally named respectively Sans Souci and Sans Peur.
1 Submarine chaser (CH 21).
5 M.T.B.s, four of which had been ordered by the Kriegsmarine as fast and large air rescue boats, and one remaining from the 1938 French naval programme (building at St. Nazaire).
4 Fleet tankers (two at Dunkirk, two at le Trait, near Rouen).

Owing to the financial difficulties, the construction of these various vessels is, however, progressing slowly.

It is possible that in the near future the Commandant Teste (seaplane transport) will be added to these vessels. She was scuttled in November, 1942, but when salved, her hull and engines were found in good condition, and it was decided to rebuild her.

PERSONNEL.

In 1939 the French Estimates provided for the Navy 74,900 officers, petty officers, and men, 41,700 being appointed to commissioned ships, and 7,500 to the Naval Air Service. Political events of 1939 called for an increase of the Navy's personnel. The decree of May 29, 1939, authorised for 1940 a total of 85,000 petty officers and men, petty officers numbering 17,850, while the decree of April 12, 1939, established the number of officers on active service to 4,868—2,590 of the executive branch, 561 engineers, 249 paymasters, 421 doctors, etc. Owing to the calling-up of naval reserves in June, 1940, the French naval personnel had grown to 180,000 officers and men.

When the French naval forces stationed overseas in November, 1942, assembled with the Free French naval forces to constitute the *Marine Nationale* and pursue the war, there existed 3,088 officers and 45,957 petty officers and men. These numbers were considerably increased in 1943 and 1944, and by the end of the war, in May, 1945, they amounted roughly to 100,000, including 1,000 S.F.F. (i.e. *Service féminin de la flotte,* the French equivalent of W.R.N.S.).

These 100,000 men provided not only complements for the ships at sea, the naval air squadrons, and the shore establishments, but also strong forces of *fusiliers* and *canonniers marins,* operating with the armies and worthy of the famous Dixmude naval brigade of 1914. There existed thus in May, 1945 :—

One regiment of *fusiliers marins* (equipped as a scouting regiment with light tanks) with the army, which operated first in Italy (General Juin) then in Provence (after August 15, 1944).

One armoured regiment of *fusiliers marins* (tank destroyers) integrated in the famous Leclerc division which liberated Paris.

One regiment of *fusiliers marins* and one regiment of *canonniers marins* which were parts of the French forces beseiging Lorient, St. Nazaire, and Royan, while still occupied by the Germans.

Two regiments of *fusiliers marins* training for the Far East (Far East Light Naval Brigade).

Several naval commandos, one of which was among the first troops landed in Normandy, and which took part later in the Walcheren expedition with the British naval and marine commandos.

The French naval personnel, as provided for the 1946 Naval Estimates, include 45,000 officers, petty officers, and men, excluding the Far East Light Naval Brigade operating in Indo-China (5,000 men) and the complement of the minesweeping flotillas (5,000 men). Up to now there has been no difficulty in maintaining the naval personnel ; there are far more demands for enlistment than is necessary, so that only efficient young men need be taken. It must be pointed out that, despite events, the French Navy enjoys the privilege of being regarded with great favour by the average French public opinion. One must not forget the influence of the presence of numerous officers and sailors in the F.F.I. resistance movements and of the *fusiliers marins* units at the spearheads of the

French armies during the liberation of France. Paris does remember that the first among General Leclerc's troops to enter the capital on August 25, 1944, belonged to the armoured regiment of *fusiliers marins* and the populations of Provence and the Rhone valley remember, too, that the Delattre army's *fusiliers marins* who were at the vanguard of this force, had done wonders in Italy and were formed with the survivors of the *fusiliers marins* battalion of Bir Hakeim fame.

THE NAVAL AIR SERVICE.

At the outbreak of war the French Naval Air Service amounted only to about 150 aircraft and 7,500 men. It was reconstituted in North Africa in 1943, thanks to Allied material help, mostly English at the beginning, and took an active part in the operations. By the end of the hostilities it numbered 10 flotillas, was about 8,000 men strong, and had successfully performed slightly more than 10,000 war missions during the two last years of the war. In the reconditioned French Navy, the Naval Air Service will undoubtedly share the most important part: it is quite possible that in the near future its personnel will be at least 50 per cent. of the total naval personnel.

When the 1946 Estimates were discussed in Paris, several politicians advised the merger of the French Naval Air Service with the French Air Force on the ground that this merging would bring substantial economies. The reason for such a drastic proposal was most probably a complete misunderstanding of the rôle of a naval air service, due to the fact that the French Navy was unfortunately unable to commission modern aircraft carriers during the war. Unable thus to fulfil any Fleet Air Arm missions, its air squadrons were used mostly for "coastal command" missions, while several flights of the French Air Force, based in North Africa, performed the same kind of operations, though exclusively in the very restricted Mediterranean area. The loan for five years of a modern aircraft carrier by the British Admiralty should, fortunately, counteract that opinion. There is no reason for that proposal to be renewed in the future, since the French Navy will presently have at its disposal an embarked air force.

AIRCRAFT CARRIERS.

Two fleet carriers had already been ordered by the French Navy when the war broke out, the Joffre and Painleve, both allocated to the St. Nazaire-Penhoët Company. They were to be 18,000 tons, with geared turbines of 115,000 H.P. designed to give them a maximum speed of 32 knots. Their plans provided for a well-designed protection, including a 4-inch belt, a protected hangar deck of 1·6 inches, and the underwater protection system was extensively developed. These ships would have had a large endurance—11,000 miles at 15 knots, and 3,000 at full speed; they were to carry 40 aircraft: 15 fighters and 25 torpedo-bombers. Their armament, entirely anti-aircraft, does not seem adequate to-day; it numbered eight 5·2-inch guns in four light turrets, two superimposed on each side of the bridge, eight automatic 37 mm. (four twin-mounts), and 24 heavy machine-guns of 0·5 inch (quadruple mounts). Work had been started on one of these ships only when the Armistice of Compiègne was signed. Altogether about 1,500 tons of the hull had already been assembled, while the entire machinery for one of them was practically ready. During the war the Germans scrapped what had been made in order to be able to build large cargo vessels on the vacant slip.

The French Navy lacks terribly this indispensable type of craft, the necessity of which has been amply demonstrated by the lessons of the war, for the only carriers at present available are slow carriers with a limited military value. One of them is the Béarn, which can be compared to the British Eagle, torpedoed and sunk in 1942 : she was ordered as a capital ship and converted into an aircraft carrier before she was completed. She was the only French commissioned aircraft carrier in 1939, and her squadrons, sent hastily to Dunkirk in May, 1940, sacrificed themselves in audacious dive-bombings of important bridgeworks and cross-road junctions. The Béarn was extensively reconstructed in the U.S.A. in 1944–45, and is now fitted as an aviation transport with an entirely new armament of 5-inch and small guns of American marks. The other aircraft carrier is the Dixmude, formerly H.M.S. Biter, which was one of the first escort carriers transferred to Great Britain under Lend-Lease agreements. No other French warships, either capital ship or cruisers, at present carry aircraft.

AIRCRAFT.

The French Naval Aviation stationed in Africa in 1942 was necessarily equipped with rather obsolete aircraft dating from 1940. It was entirely remodelled in 1943 with British aircraft at first, then with some American. Allied material is still being used at the present moment : Wellingtons, Sunderlands, and Catalinas for long-distance patrol, Dauntless-S.B.D. (scout-bombers), Venturas (patrol-bombers), and Seafires (fighters).

Great efforts are being made to provide the French Naval Air Service with French-built aircraft, if not all of French design. French aeronautical industries are still equipped mostly for producing German models, which they were compelled to manufacture during the war. For this reason, several French naval air flights have been given Dornier 24 (long-distance patrol or transport), Junkers 88 (torpedo-bombers), and training aircraft such as Morane 502, Nord 1,000, NC 701, which are replicas of the German Fieseler Storch, Messerschmidt 108, and Siebel 201.

Two types of French aircraft which were to be built in 1940 have been accepted for utility and transport : they are respectively four-engine seaplanes of 28 tons (Bréguet 730 and 731) with a span of 126 feet, four 1,150/1,300 H.P. engines (speed 200 m.p.h.), and four-engine landplanes of 24 tons (Bloch 161).

The French Naval Air Service has also ordered new torpedo-bombers (Bloch 175) of a very modern design which compares favourably with similar foreign craft. Their main characteristics are: span, 60 feet; weight, 7·5 tons ; Gnôme et Rhône engines (two 1,180 H.P.) ; maximum speed, 380 m.p.h. ; endurance, 7½ hours at 240 m.p.h. ; ceiling, 30,500 feet; crew, 3 ; armament, three 20-mm. guns, eight rockets, one torpedo, or three anti-submarine depth-charges of 365 lb. each.

Jet-propelled aircraft (English Derwent licence) will also be used experimentally in the near future.

THE HIGH COMMAND.

The constitution of the French armed forces and Military High Command has been laid down by two decrees issued in Algiers on December 16, 1943, and April 4, 1944, by the French Liberation Committee. According to these decrees, the President of the French Government is the Chief of the French armed forces; he is assisted by the National Defence Committee. At the same time, a General Staff for National Defence was established.

The end of the war, the re-establishment of Parliamentary institutions, the creation in November, 1945, of the Armed Forces Ministry and of an Armament Ministry, replacing the former War, Navy, and Air Ministries, made necessary some adjustments to this organisation, which was done by a new decree issued on January 4, 1946.

The present organisation is based on the following principles:—

1. The Government alone can prepare for, and direct, war, with the assistance of the highest military authorities existing.

2. Victory is won, not by this arm or that, but by the full collaboration of all fighting forces, which must be employed interdependently, all being directed alike towards one end. Hence, the absolute necessity to entrust the preparation of armed forces to one department only, the so-called Ministry of Armies, and in each theatre of operations to provide integration of the three Services, Army, Navy, and Air, under unified command.

3. In view of the character of modern conflicts and the hoped-for international organisation for security, the French Military High Command must be organised so as to be capable of becoming easily a part of an inter-allied or International Military Command.

4. The lessons of the war demonstrate the advantage of having one single command for war industries; hence the necessity for an Armament Ministry which must exist permanently and not only in war-time.

The National Defence Committee, instituted to advise the President of the Government, Chief of the Armed Forces, includes the Armed Forces Minister, the Armament Minister, other Ministers when their departments are interested, the Chief of the National Defence General Staff, the Chiefs of the Army, Navy, and Air General Staffs, the three Directors responsible for the Army, Navy, and Air war productions. This Committee is responsible for the employment of the Armed Forces, their general organisation, the military organisation of metropolitan and extra-metropolitan French territories, the armament programmes, and the distribution of military personnel and material resources.

Secretarial work for this National Defence Committee is performed by the National Defence General Staff, the functions of which include drafting of decisions affecting the whole of the three Services, and the military representation of France in international or inter-allied organisations. It is also responsible for high military schools, and its Chief is invested with the privilege of assembling the Chiefs of Staff of the three Fighting Services together with the flag-officers appointed as General Inspectors.

The Armed Forces Minister is responsible for the calling-up, the instruction, mobilisation, and maintenance of the whole of French military forces. He supervises directly the General Inspectors, the various staffs and departments of each of the Fighting Services, and, together with the Minister of Armaments, is responsible for the preparation of the armament programmes. Forces not assigned to any particular theatre of operations, or to occupied Germany and Austria, come directly under his orders.

The National Defence Chief of Staff is, at present, General Alphonse Juin, who has held his appointment since 1944, following his brilliant command of the French Army in Italy. He is assisted by two Assistant Chiefs of Staff, one of them being Rear-Admiral Barjot, one of the youngest flag-officers in the French Navy (47 years old) who played an important part in the Resistance movement in North Africa before the Allied landings, and is a well-known writer on naval and air subjects. The Chief of the Naval Staff is Vice-Admiral Lemonnier, who was appointed on August 1, 1943.

At present French metropolitan territory is divided into three Maritime Commands, with their respective headquarters at Cherbourg, Brest, and Toulon. Two other Maritime Commands of similar importance are being organised in Africa, with headquarters in Algiers and Dakar, while a strategical base and an important fuel depot exist at Diego Suarez (Madagascar). Before the war the only extra-metropolitan naval command was that of North Africa (Bizerta). The new organisation emphasises the growing interest and importance attached by the French Military High Command to valuable strategical points existing overseas on French territories.

The most important sea-going French force is that at present stationed in Far East. It is divided into two separate squadrons, the Far East Naval Forces (F.N.E.O.) under the command of Vice-Admiral Auboyneau, and the Indo-China Division (Rear-Admiral Graziani). Both forces together comprise some thirty vessels, among which heavy and light cruisers, an aviation transport, frigates, *avisos*, minesweepers, and several aircraft flotillas.

The metropolitan forces are to be reorganised into a " task force " called "*force d'intervention*," which will include the Richelieu, one aircraft carrier, and the most modern medium cruisers and torpedo boats. Local flotillas will also be constituted for training purposes.

THE ACTIVITIES OF THE FRENCH NAVY SINCE V-DAY.

As already stated, it is not within the scope of this article to give details on the operations of the French Navy during the war, but merely to indicate what it has been doing since the Liberation and Victory. It has taken, and is still taking, a very important part in the reoccupation of Indo-China, where it is represented not only by a strong naval force, but also by a light brigade of *fusiliers marins*. Many of these units have distinguished themselves in guerilla operations.

Owing to the shortage of merchant shipping under French flag since the suppression of the inter-Allied shipping pool, many French war vessels have been used to maintain necessary liaisons with French extra-metropolitan territories. Between August, 1944, and January, 1946, for instance, 262,000 passengers, among whom 32,000 civilians, and 50,000 tons of material and supplies, have been transported between French North Africa and metropolitan France. More recently, the Navy was the only service able to provide urgent communications between France and Corsica, and *contre-torpilleurs* as well as escort vessels were used to carry civilian passengers, mail, and urgently wanted medical supplies. During the same period, several naval tankers were incorporated in the inter-Allied pool, and carried 700,000 tons of oil, while several others transported 150,000 cubic metres of petrol and gas oil between France and her African colonies.

French naval aircraft have also been used extensively for similar liaison and transportation duties, carrying not only high officials, but eventually repatriated prisoners, demobilised soldiers, and colonials.

An important naval detachment was sent to the Rhine. It is mostly thanks to its efforts that the navigation on this important European artery was reopened in November, 1945. By that date, the French Navy's Rhine Flotilla had checked all wrecks, revised the charts, put in order a dozen yards and repair works, and repaired with its own personnel 15 tugs and 100 of the large Rhine barges.

Similar detachments have been working in all French ports to recuperate what could be saved from the tonnage found sunk or scuttled. More than 65,000 tons of shipping (small craft) were thus recovered, and 1,800 wrecks of all kinds (amounting to 474,000 tons, among which were 120,000 tons of port equipment) were salved, while channels and quays were cleared. French naval missions have also been sent to Germany and Italy to identify looted material and recover it.

The Navy, of course, had the task of sweeping the mines which infested French coasts. Several thousands of square miles have already been cleared by 115 minesweepers, some of which are ex-German M-boats specially provided for this task.

CONCLUSION.

In the new world emerging after the war, France ought to play a rôle in accordance with her traditions, her political and economic importance, and occupy the position which she has achieved as a result of the toil of generations, and which the sacrifice of so many Frenchmen, killed in the two last wars, has entitled her to hold. She must therefore make the necessary efforts to take her share in the new international organisation, and be able to co-operate effectively with the other great Powers who are desirous that the equilibrium of the peace for which they have paid so dearly shall never be disturbed. On the sea, which is an international domain, French naval air squadrons and ships must be able again to take their place. One can only hope that the economic situation of France will permit a quick revival of the Navy. French public opinion is now well aware of the importance of aero-naval power, and among French youth there is growing up a definite love of the calling of the sailor and an understanding of its grandeur. That a publication like the magazine "*Marine Nationale*," which started in Paris in November, 1944, has to-day a regular circulation of 92,000—which would be larger but for the shortage of paper—is a typical indication of the interest in the sea and naval affairs which has awakened so vigorously for several years past among the French people. In this growing sentiment lies one of the greatest assets of the future of France's Navy.

H. Le Masson.

CHAPTER VII.

THE STRATEGY OF JAPAN.

***Note.*—This chapter, which was written for "Brassey's Naval Annual," has also been published in the United States, by agreement, as an article in *The Infantry Journal*.**

The revelations of the Nürnberg trials, of the Pearl Harbour Committee and of individual Japanese leaders like Prince Konoye have shed a great deal of light upon the political considerations which led the Japanese military leaders in the autumn of 1941 to take over the leadership of their country and to unleash the Pacific War on December 7. But they have failed so far to link up that political decision with its strategic foundations; with the question, how did the Japanese militarists expect to wage, and to win, that war? By what means could a country so poor in every respect—in basic resources, in industrial potential, even in man power—hope to defy successfully the combined might of the two greatest naval and industrial powers of the world? That question is the heart of the Pacific War. It is the key to the entire Japanese strategy, the explanation of its many seeming inconsistencies. In order to understand it, it is, however, necessary to go back beyond the discussions of that tense autumn of 1941, to the past, to Japan's former wars against China and Russia. For it was the experiences of these wars, which, transposed into modern conditions and weapons, formed the basis for that fateful decision, and for Japan's conduct of the war.

The outstanding experience of the naval and military leaders of Japan ever since the time of the forcible "awakening" of their country by Admiral Perry had been the extreme weakness of their country in basic strength—resources and man power—and above all in modern technological potential. Compared with the gigantic size and resources of their neighbours, the Chinese and the Russian Empires, they were mere pygmies. If they had ever attempted to challenge these colossi upon an equal basis they would have gone down in disaster—as the world expected them to do both in 1895 and in 1904–05. Yet, on both occasions it was they who had emerged victorious from those unequal contests.

The secret of their success both in 1895 and in 1904–05 had lain in their ability to utilise superior sea power in order to restrict an "unlimited conflict," which they knew they could not have stood through, into a "limited war" adapted to their strictly circumscribed forces. Both in 1895 and in 1904–05 they promptly established complete ascendancy at sea over their opponents and then exploited that one-sided "naval superiority" in order to overwhelm their limited territorial objectives, Korea and South Manchuria, challenging their opponents to come and oust them again from these conquests. In both instances these opponents saw themselves faced with the dismal prospect that they might perhaps, at the price of exorbitant exertions, succeed in pressing back again the Japanese on land, but owing to the temporary elimination of their naval forces could never hope to extend that dearly bought success to complete victory across the sea. Thus it is not surprising that first China and then Russia preferred a negotiated peace to the continuation of a game that at the best could only end in a draw.

So strictly circumscribed were, however, the Japanese forces that even these "limited wars" proved almost too much for them. In the conflict with China in 1895 Japan was pitted against an opponent whose immense potential military strength was entirely undeveloped, so that the actual naval and military forces on both sides were not too dissimilar. In 1904–05, however, the Japanese commanders found themselves outmatched from start to finish, and it was only through their cool acceptance of an uninterrupted series of "calculated risks" that they were eventually able to secure final success. Japan's entire plan of campaign stood and fell with Admiral Togo's ability to control the Russian naval forces opposing him and thus to enable the Japanese armies to land on the continent and drive the Russians out of Korea and South Manchuria. Yet Togo had to reckon with two Russian fleets, each approximately equal to his own whole force, the Far Eastern Fleet at Port Arthur and the Baltic Fleet in Europe. Worse still, because Japan's own shipbuilding resources were not yet equal to the building of battleships and armoured cruisers, the 6 battleships and 8 cruisers which formed the backbone of his fleet and the cornerstone of the entire Japanese strategy were irreplaceable if lost.

By his surprise torpedo-boat attack on the Russian fleet in Port Arthur, which formed the infamous model for Pearl Harbour, Togo succeeded in temporarily disabling 3 out of the 7 battleships of that force. But while with his own fleet he kept watch over it—losing two of his battleships on mines—he knew that merely to keep that fleet under control was not enough. That he had to eliminate it for good, before the Baltic Fleet had time to come out to the Far East and take him between two forces. And what was more, he would have to destroy the fleet at Port Arthur without incurring thereby losses which would make it impossible for him to meet the Baltic Fleet, when it came in its turn. The strategy by which Togo succeeded in solving this appalling task of defeating in succession two fleets, each of equal strength to his own, was, therefore, determined by the strictest possible economy of his forces. While the Japanese battle fleet was kept rigidly in reserve, to be thrown in only when absolutely unavoidable, the task of whittling down the Port Arthur Fleet was entrusted to other forces which could be more readily replaced: mines, blockships, torpedo-boats; above all, however, to the Japanese Army. General Nogi, the Japanese commander before Port Arthur, ruthlessly sacrificed thousands upon thousands of his best troops in the capture of the heights from which the Japanese were then able to survey the harbour and destroy the Russian Fleet at anchor by long-range artillery fire. Thus the Japanese battle fleet was able to maintain the indispensable "command" over the Far Eastern waters without ever emerging from its role as ultimate reserve; and when some months after the fall of Port Arthur the Baltic Fleet came out to the Far East, Togo was able to meet it with unimpaired forces, and in the battle of Tsushima to inflict upon it one of the most decisive defeats known to naval history.*

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* That the Japanese *themselves* had consciously planned their war against Russia as a "limited war" is confirmed by Sir Julian Corbett. After that conflict the Japanese furnished the British Admiralty under the Anglo-British alliance with inside information, which Corbett used as the basis of his study of the Russo-Japanese War. That study has not been made public; but the gist of it was incorporated by Corbett a few years later in Chapter VI of his "Principles of Maritime Strategy," in which he analyses the Russo-Japanese War as a *classical example* of a "limited war."

The same conditions which had determined Japan's strategy in 1895 and in 1904–05 still continued to determine it in 1941.

In the 36 years since her war with Russia, Japan had achieved a vast expansion of her military and economic strength. Yet, her fundamental weaknesses had not been eradicated thereby. Her main source of strength, her man power, was still absorbed to an inordinate extent by uneconomic methods of agricultural and industrial production. Her industrial capacity, although feverishly expanded during the past five years, had still hardly reached the level of a minor industrial power like Belgium. Moreover, the expansion of her industrial potential merely served to accentuate still further her dependance upon outside sources for most of her strategic raw materials : oil, iron ore, scrap, tin, chromite, rubber.

Meanwhile the " Chinese incident," so rashly begun four years earlier at the Marco Polo bridge near Peiping, had led Japanese policy into an impasse. By the summer of 1941 even the leaders of the Army had been forced to the conclusion that the war against the Chinese National Government in Chungking had bogged down. Either the war would have to be broken off and the Japanese armies withdrawn from China—a " loss of face " which the army leaders stubbornly refused to accept—or else Japan would have to expand the war, to include the British Empire in her enemies and seek to cut the lifeline of the Chungking Government by invading Burma. Such a move southwards would have simultaneously solved Japan's economic " heel of Achilles " by the conquest of the economic resources of British Malaya, Sumatra, Java, and Borneo. But, as Foreign Minister Matsuoka had to admit to Adolf Hitler on April 4, 1941, the Japanese naval and military leaders were convinced that in such an attack upon the British and Dutch possessions in South East Asia would inevitably bring the U.S.A. into the struggle.

This exceedingly tense political-military situation was still further intensified when a few months later, in July 1941, the U.S.A., followed by Britain and the Netherlands, imposed upon Japan a financial and economic embargo. Together with the military impasse in China it placed the Japanese leaders in a position in which they would see themselves forced to decide within a measurable period of time between three alternatives : either to break off their war of aggression in China and Indo-China and come to an arrangement with the Anglo-Saxon democracies—the line which Prince Konoye apparently tried to pursue up to his fall in the middle of October ; to persuade the U.S. Government, by the threat of " something terrible " which would otherwise happen in the " explosive situation " in the Pacific, to lift the embargo without any clear Japanese commitment to the termination of the " China incident "—the purpose of the Kurusu mission ; or, finally, to break simultaneously both the military impasse and the economic stranglehold by open force. This last, however, meant a war against the United States, an undertaking more formidable even than had been the challenge to China in 1895 and to Russia in 1904–05. So tremendous was the prospect that in contrast to the Army, which professed its confidence to overrun South East Asia in two to three months, the Navy leaders appear for a long time to have been reluctant to envisage such a struggle, although the expansion into the " South Seas " was the traditional naval line. However, Admiral Yamamoto, the energetic commander of the Japanese combined fleets, had instituted from January 1941 onwards an inquiry into the ways and means for reducing that seemingly impossible undertaking to manageable proportions. Out of these investigations emerged a plan, which, tested first in fleet manœuvres in August 1941 and subsequently in a gigantic war game in Tokio from September 2 to 13, was finally adopted by both the Navy and the Army chiefs.

Essentially this war plan was nothing but the reapplication of the strategy of a " limited war," so successful against China in 1895 and against Russia in 1904–05, to the new situation and to the new weapons which had emerged since that time. Just as in those earlier conflicts the Japanese strategists had wisely refrained from any attempt to aim at an all-out victory beyond their means, and restricted their efforts to the isolation, occupation, and defence of a limited strategic objective, so Yamamoto's plan renounced from the outset any hope of inflicting a decisive defeat upon Japan's opponents and restricted itself sharply to one limited objective : the isolation and over-running of South East Asia. Thus Chinese resistance would be crippled by the cutting of the Burma Road and the " Chinese incident " brought to a successful conclusion. Japan's economic " heel of Achilles," her dependence upon the strategic raw materials of Borneo, Malaya, Sumatra, and Java, would be eliminated by the incorporation of those territories into her Empire ; and once thus made proof against economic pressure she would, as on the two former occasions, be able to sit back with equanimity and defy her opponents to oust her again from her conquests. Provided that she did not let herself be drawn into unlimited adventures and husbanded her forces carefully, she would have a good prospect of frustrating their inevitable counter-attacks and by wearing them out to compel her enemies once again to accept the *fait accompli.*

For this war plan the essential part was the conquest of Borneo, Java, Sumatra, Malaya, and Burma. The conquest of the Philippines was not to the same degree absolutely essential. Economically, they had little to add to the oil, iron ores, tin, and rubber of the " South Sea Territories." Strategically, they were, despite their flanking position, no indispensable stepping-stone for the Japanese drive against those territories. The Japanese strategists could have carried through that drive—as they actually did to a considerable extent—without touching the Philippines, merely observing and " masking them "—operating from their advanced concentration areas in the Palau Islands on Hainan and in Indo-China. From the broader political point of view there would have been in fact every reason for going to the extreme to avoid anything that could contribute to bring the United States into the conflict. But Yamamoto and his collaborators did not see it in that light. To them the intervention of the United States was a foregone conclusion and the only " realistic " policy to nip that intervention in the bud by temporarily crippling her by a surprise attack against her naval forces and bases in the Pacific. For that reason the violent conflict between those Japanese Admirals who wanted to concentrate *all* forces upon the drive to the south and those who contended that it would need to be " secured " by an attack upon the Pacific Fleet at Pearl Harbour, was finally decided in favour of the latter by Admiral Nagano, the all-powerful Chief of the Japanese naval staff. So completely was Nagano dominated by this purely strategic approach to the issue, that even after the defeat of Japan he persisted in asserting that the order to attack Pearl Harbour had been " no mistake " and that without the success of that attack Japan would have been defeated far earlier.

In contrast to this violent dispute among the Japanese strategists, whether to include the attack upon the Pacific Fleet at Pearl Harbour in their plans or not, the other issue, so hotly discussed in this country, why they did not decide " to go the whole hog " and take the Hawaiian Islands themselves, did not preoccupy them to any marked extent. It was raised, and decided against, on subordinate technical grounds in the course of the war game on September 6 and 7. This decision, for which they have been held up to so much scorn and ridicule, reveals itself as entirely consistent, once it is envisaged from their fundamental conception of a " limited war." Their main attention was directed to the " South Seas." The inclusion of the attack upon the Pacific Fleet had already strained their plans and resources to the limit. To go still further would have meant to incur the acute risk of defeating their entire scheme for the sake of an additional advantage not strictly indispensable to their ends. For their purpose of keeping the United States from intervening during the first critical six months a crippling blow at the Pacific Fleet was enough; while as the stepping-stone to an attack upon the United States themselves the Hawaiian Islands were useless to them, because such an attack was far beyond anything they could hope to propose to themselves.*

This extreme " tenseness " of the Japanese plan of operations between the main drive to the " South Seas " on the one side and the " protective stroke " at the Pacific Fleet in Pearl Harbour on the other was still further intensified by the necessity of co-ordinating it with the Kurusu mission to Washington. The result was that Kurusu's mission was almost foredoomed to failure because of the extremely short time limit set to him to produce decisive results—Kurusu arrived in Washington on November 20, and was originally given the 25th as his dead-line, which with considerable difficulty was extended to the 29th. On the other hand, the complications entailed by it for the military action were such that it is hard to believe that it was meant from the outset merely as a camouflage.

The greatest difficulty of all, however, was in the co-ordination of the surprise attack against Pearl Harbour with the launching of the operation against Malaya at the other end of the 5,000 miles arc spanned by the Japanese plan of operations. To the eyes of the Japanese strategists, this second major blow, designed to eliminate the latent menace of Singapore, isolate the Netherland East Indies from the West and form a flank against the Indian Ocean, was no whit less important than the blow at the Pacific Fleet. So impressed were they with the necessity for the utmost speed in carrying it through that they decided to launch it simultaneously with the attack against Pearl Harbour, without waiting for the outcome of that highly adventurous undertaking.†

Even more grave was the fact that in doing so they were forced to disclose prematurely at least part of their plans and thus to endanger the surprise effect upon which they were counting so heavily to offset their limited forces. For, unlike the attacks against Pearl Harbour, Midway, Wake, and Guam, the launching of a large armada of transports and warships from Hainan could not possibly escape observation in the comparatively narrow waters of the South China Sea. All they could do was to seek to deceive the Allies as to its destination by first directing it against Bangkok and making it change its course midway against Northern Malaya. While this oversubtle stratagem failed, the premature disclosure that something was afoot played, in its total effect, singularly into their hands by concentrating the attention of the Allied strategists still further upon South East Asia, and thus contributing to make the surprise at Pearl Harbour even more complete.

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* The outlook of Yamamoto and his collaborators towards the attack on Pearl Harbour is most illuminatingly characterised by a speech which Yamamoto made to the attacking crews upon their return. Pointing out to them this would give Japan freedom of action in the Western Pacific for some six months he emphasised that this was *not* an *all-out victory*. To achieve such a victory it would have been necessary to carry on the attack further to the occupation of the Hawaiian Islands, to a decisive attack upon the United States, and to the point where he, Yamamoto, would have been able to dictate peace in the White House. This speech was distorted into his famous " boast " that he *intended* to dictate peace in the White House.

† The success of the Japanese attack upon Pearl Harbour has tended to obscure the fact that they themselves felt anything but sure of its outcome when they launched it. We know to-day that they reckoned with a loss of one-third of their task force even in case of a success, and had braced themselves against the possibility of a complete disaster.

The task of this second Japanese major force had meanwhile been further complicated by the arrival in Singapore late on December 2—about the time that the Japanese set out from Hainan—of Admiral Sir Tom Phillips with the two battleships Prince of Wales and Repulse. Two older battleships, Revenge and Royal Sovereign, were following. To crush this powerful opponent the Japanese strategists had concentrated in their turn an overwhelming force; but before this could come into action, Admiral Phillips's ships had already been caught by their naval fliers on his heroic sortie to cut off the Japanese armada at Singora and Kota Bharu, and sunk off Kuantan on his way back.*

With the sinking of the Prince of Wales and of the Repulse the Japanese strategists had dominated the only remaining force of capital ships which after the immobilisation of the U.S. Pacific Fleet at Pearl Harbour could still have seriously interfered with their operations, and had established their absolute naval superiority in the entire area between India in the west and Australia in the east. Yet, even this absolute superiority could not induce them to relax for a moment the extreme circumspection with which, despite the apparent recklessness of their moves, they were carrying through their plans. Just as Togo forty years earlier had been harassed by the dilemma of having to eliminate the Russian fleet at Port Arthur, and yet of having to preserve, at the same time, at all costs, his irreplacable handful of capital ships in order to be able to meet thereafter the Baltic Fleet; so his successors in the second world war were strictly circumscribed by the same imperative necessity of preserving their main fleet as the backbone of their " command " of the western Pacific, and the central reserve upon which their ability to ward off the Allied counterattacks in the second defensive phase of their war plan would depend. In the words of the Japanese naval attaché in Berlin, Rear Admiral Yokoi, all actions against the enemy's forces would be subject to the fundamental condition that the main force would have to be preserved without serious " losses." Thus, even after the temporary elimination of the Allied capital ships, the Japanese strategists were not willing to expose

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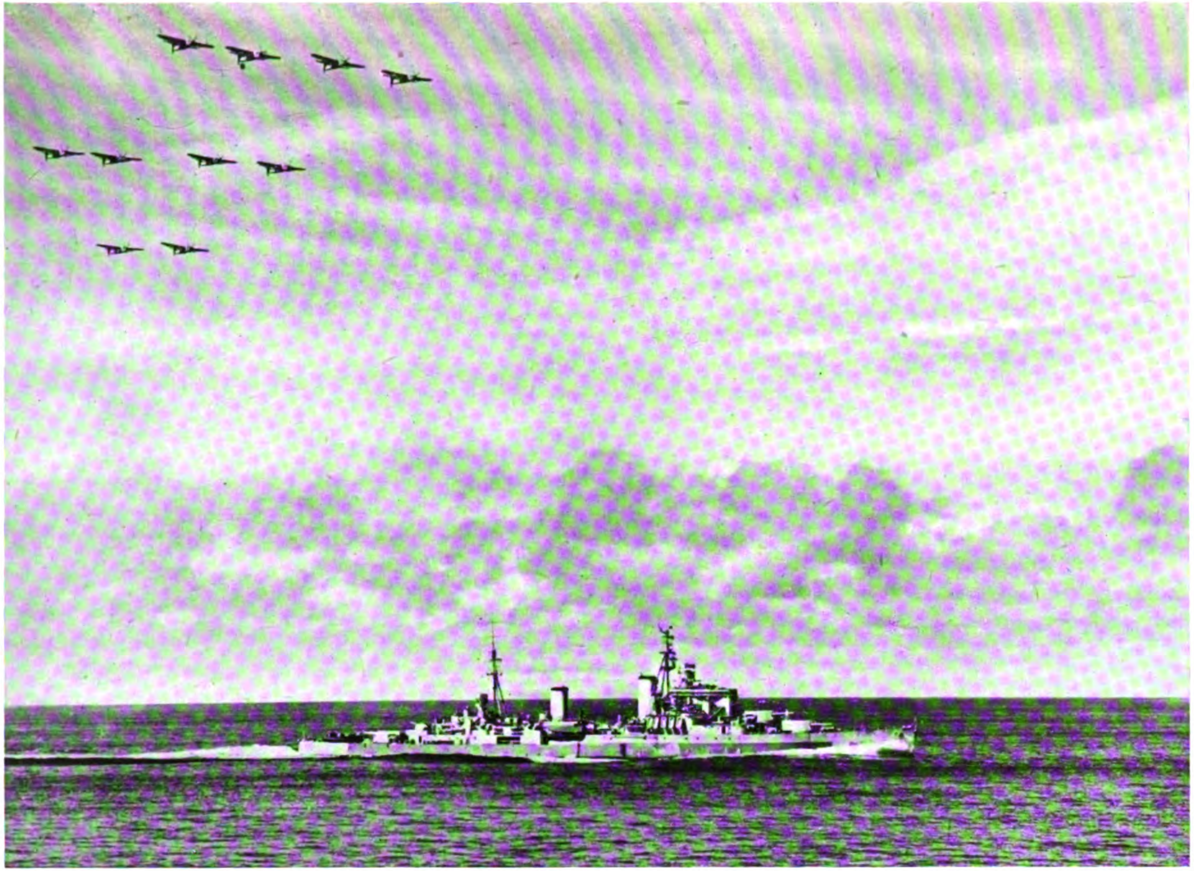
* So difficult had been the task of withdrawing ships from the struggle in the Mediterranean and Atlantic that Admiral Phillips arrived in Singapore with only four destroyers. Under an agreement made by him on December 6 in Manila with Admiral Hart these were to be supplemented by four American and six Dutch destroyers. But his greatest weakness was the lack of any carrier-borne air protection. By that most unlucky series of adverse incidents which pursued the Royal Navy in the weeks preceding the outbreak of the Pacific War, the Ark Royal, which had first been detailed to accompany him, had been sunk by a German submarine on November 13 in the Mediterranean and the Indomitable, which was to have replaced her, ran aground in the harbour of Kingston, Jamaica, and had to be sent to Great Britain for repairs. A third carrier was not available, however great the need.

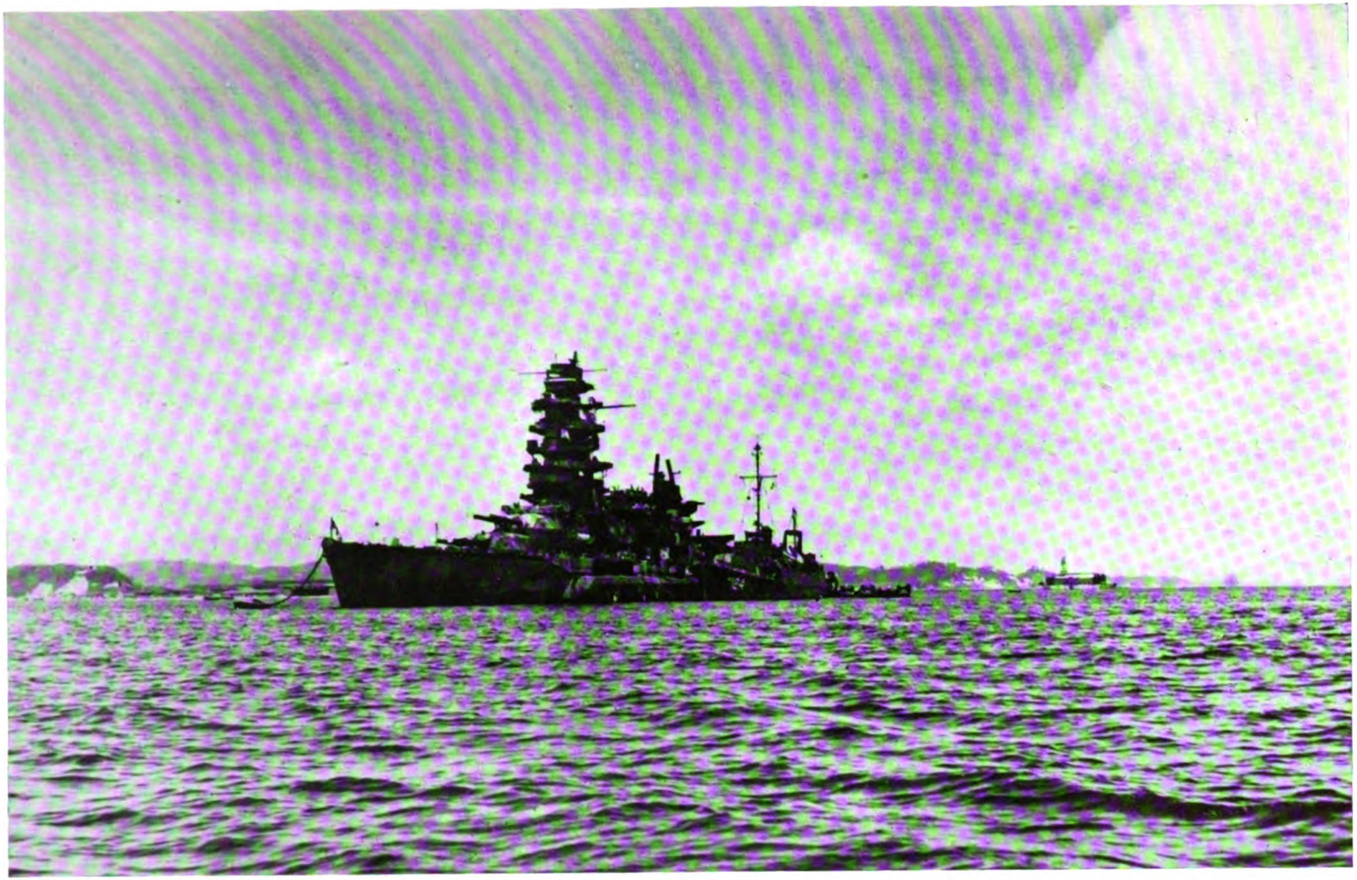


H.M.S. Swiftsure flying the flag of Rear-Admiral Harcourt entering Hongkong to receive Japanese surrender.

(British official photograph. Crown copyright reserved.)

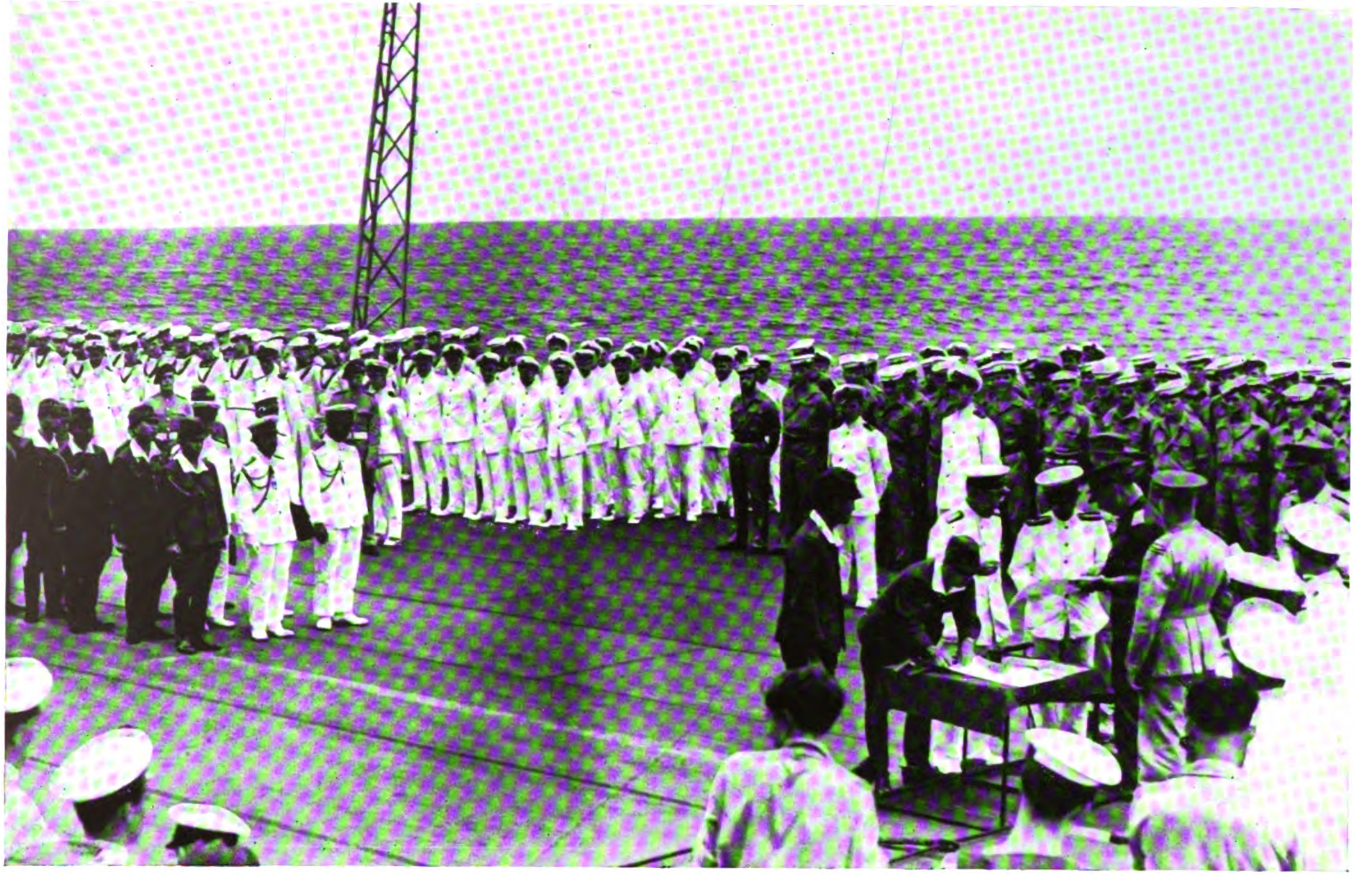
U.S.S. Helena, Cruiser.

(Official U.S. Navy photograph)



Japanese battleship Nagato, the only survivor, in Tokyo Bay after surrender.

(British official photograph. Crown copyright reserved.)



Surrender Ceremony at Rabaul on board H.M.S. Glory.

(British official photograph. Crown copyright reserved.)

their own to any avoidable risks from Allied submarines and planes, but kept them well to the rear, preferring to carry through the overwhelming of the weak Allied forces still opposing them with similar, more easily replaceable forces: light naval units, transports, land and air forces.

Neutralising and isolating one Allied position after the other from the air before launching forth their vulnerable transports under the protection of strong escort forces, they were able to drive forward systematically, and yet with extreme rapidity, from one key point to another without ever offering to the Allied commanders an opening for a really crippling counter-stroke. In this manner first Singapore and thereafter Java were caught between successive pincer movements and the Allied naval forces under Admiral Doorman were driven by incessant bombing attacks to the south of the Dutch East Indies. When Doorman's attempt to come back to the north of Java and break through the Japanese escort screen into their eastern transport fleet failed in the Battle of Java, the last remaining obstacle to complete Japanese "command" of this entire area was removed and the struggle for the South Sea territorities was won. A few days later Japanese forces landed in strength in three places on Java and within little more than a week brought about the surrender of that centre of resistance, soon followed by those of the other islands.

The conquest of Malaya and the Dutch East Indies released considerable Japanese forces for the reduction of the Philippines, where the Japanese had encountered unexpectedly stiff resistance. The surrender of Bataan (April 8) and Corregidor (May 6) marked the final "reduction into possession" of the entire "strategic objective" isolated by the twin blows of Pearl Harbour and Kuantan, almost exactly six months after those two successes. It was a breath-taking achievement and yet it had taken more than twice as long as the two to three months which the Japanese strategists had set themselves out for this task in the deliberations of the previous September. The desperate delaying action of the outnumbered Allied defenders had not been fought in vain.

Even before this conclusion of the struggle for the Philippines the breakdown of Allied resistance in the south had placed the Japanese strategists before a vital decision, the most vital that was to confront them in the entire course of the war: the decision whether to push on into the Indian Ocean or not.

The resistance of the Allies in Malaya and the Dutch East Indies had given the British authorities in India a few invaluable weeks to strengthen their defences. But even so they were still woefully weak. By the desperate expedient of withdrawing all British capital ships from the Mediterranean—leaving the holding of that vital line to a handful of cruisers, destroyers, and submarines, backed by the R.A.F. and the Eighth Army—the Allied strategists had succeeded in re-establishing a substantial force in the Indian Ocean under the command of Admiral Somerville. But of that fleet only one battleship, the Warspite, was fully efficient; the four others, the Revenge, Royal Sovereign, Resolution, and Ramillies were inadequately modernised and liable to break down under strain. The two aircraft carriers Illustrious and Indomitable carried obsolescent planes, except for a handful of fighters. The destroyers were a very mixed lot, some so old that it was a marvel they could still go on. When the Japanese strategists a month after the fall of Java struck a blow in force at Colombo, Ceylon, at the beginning of April, they caught Admiral Somerville's fleet in the act of concentration, sank the old carrier Hermes and the two large cruisers Cornwall and Dorsetshire and forced Somerville to surrender temporarily control of the Western and Central Indian Ocean, and to withdraw his force to Kilindini on the East African coast. There, however, the Japanese failed to follow him, but withdrew instead to their bases in Singapore and Penang, never again to enter the Indian Ocean in force. Their subsequent activities in that direction were confined to sporadic attempts to disturb the Allied lines of communication by submarines and occasional surface raids too intermittent to become really dangerous.

Yet, during those anxious summer months of 1942 they held here in the Indian Ocean the fate of the war in their hands. The entire global strategy of the Allies stood and fell with their ability to maintain the vast barrier of Russia, the Near East, India and China between the two Axis groups, until such time as the tremendous resources of the United States could be mobilised and the counter-offensive first against the one and then the other Axis group started. The lifelines from the two Anglo-Saxon sea powers to this central block ran almost entirely through the Western Indian Ocean. Without the uninterrupted flow of supplies in men and material over them—from March onwards, when the build-up for El Alamein began, through the summer and autumn 1942—neither the Russians could have held out and turned the tables on Paulus at Stalingrad, nor the British on Rommel at El Alamein. To all this the Japanese strategists were certainly not blind. But for them to concentrate all their naval forces in the Indian Ocean in a supreme effort to cut the Allied lifelines through the western basin would have needed more than merely insight. It would have needed the resolution to break completely with all the foundations of their strategic planning ; to abandon their idea of a circumspect " limited war " in favour of a reckless all-out effort ; to surrender their jealously guarded " strategic independence " in favour of a genuine and whole-hearted co-operation with their European Axis partners in a common War Plan ; finally, to break off their victorious advance in the Pacific, before they had been able to round off and fortify their conquests, in order to win in the Indian Ocean a victory mainly for their nominal allies, whom they distrusted and feared. What the Japanese strategists did *not* realise was that they had no choice ; that their cautious " independent " and " limited " strategy was radically unsound in a worldwide conflict, and that the only, slender, chance of salvation would have lain precisely on such a seemingly reckless " unlimited " global strategy.

The fatal effects of their plan of a " limited war " restricted to the occupation and defence of South East Asia went even further. Not only did it prevent them from acting effectively in the only direction that might have held out the hope of a decisive success ; it prevented them from acting with full concentrated energy in *any* direction. While they squandered a considerable part of their forces in their fruitless raid against Ceylon and into the Bay of Bengal, without the determination of following it up, they missed at the same time other opportunities in the opposite direction through lack of the necessary strength.

From the outset the Japanese strategists had fully recognised the vital necessity of preventing the Allies from developing Australia into the main basis for their counter-offensive. Just as in the case of India, they realised that Australia as a whole was too large a bite for them to swallow. But they hoped that by occupying its northern territories and cutting its lines of communications from the east as far as New Caledonia, New Zealand and Samoa, to be able to isolate and neutralise it. Thrusting vigorously in that direction simultaneously with their drives against Malaya and Java they had reached by the time of the collapse of the Allied resistance after the battle of the Java Sea, the beginning of March, Lae and Salamaua in New Guinea, and Bougainville in the Solomons. Australia's defensive power at that moment was almost non-existent. Of four field divisions three were in the Near East, the fourth lost at Singapore. Equipment of every kind was pitifully short. Air support consisted of a handful of obsolete planes. If the Japanese commanders at this moment had been willing to depart from their methodical strategy of moving forward step by step, they might have by-passed New Guinea under cover of their carrier air forces and captured the strategical centre of the Australian defence, Port Moresby, garrisoned only by a single brigade of raw militia. But true to their determination not to take any step forward without adequate aerial preparation and support they hesitated and lost the fleeting opportunity. When in the beginning of May they resumed their push through the Solomon Islands and the Coral Sea toward New Caledonia and New Zealand they were stopped by the twin blows of the counter-attack on Tulagi (May 4) and the battle of the Coral Sea, in which they lost their first capital vessel, the carrier Hosho.

At this point the reactions of the Japanese strategists are most difficult to understand, and the cramping influence of their idea of a "limited war" is most strikingly evident. For their drive to the south-east, to the isolation and neutralisation of Australia, was not like their advance into the Indian Ocean, a move tending to lead them away from their fundamental objective and therefore readily abandoned at the first evidence of resistance. It was an integral, in fact the most important remaining part of their original programme, and its temporary arrest was felt by them as a most painful blow. Yet, instead of responding to it by the concentration of their forces here at the decisive point and the resumption of their drive in overwhelming strength, we find them in the month after the defeat in the Coral Sea giving up this line for the time being altogether, and dispersing instead their attention and their forces in four directions, as widely divergent as possible: attacks by special submarine groups against the British forces at Madagascar and in the harbour of Sydney, as well as by large expeditionary forces against the Aleutians and against Midway. While the three former operations achieved little of significance except the occupation of Attu and Kiska in the western Aleutians, the strongest, the expedition against Midway ran into the trap there prepared for it by the American strategists and lost at one blow the backbone of the Japanese carrier force.

The defeat at Midway dealt the Japanese power of offence a most severe blow, but it did not yet break it altogether. In warships, even in carriers, in transports and men, the Japanese still held the superiority over the Allies, and the weakness of their carrier force could be offset by strong concentrations of land-based planes.

Thus within little more than a month after that disaster the Japanese resumed the attack in the crucial New Guinea–Solomons area, broken off after their defeat in the Coral Sea. Of the two-pronged drive, the land attack from the Buna–Gona area, occupied on July 21–22, pushed in the middle of August up the mountain trail across the almost impenetrable Owen Stanley Range, captured the only airstrip at Kokoda, and straggled through to within 30 miles of Port Moresby. But the 3,000 Japanese soldiers, exhausted, diseased, starving, mercilessly strafed day after day, who reached Boribaiwa, were in no position to carry on their attack and had to fall back again in dissolution, when the simultaneous landing on Milne Bay, in the extreme south-eastern tip of New Guinea, had been bloodily repulsed by American and Australian forces.

The second drive from the Solomons south-eastwards never got even as far as that. The landing of the U.S. Marines on Guadalcanal on August 7, 1942, a week before the Japanese had counted on completing the airfield there and moving in their land and naval forces under its protection, took the Japanese completely by surprise. Even after that initial setback they still had a fair chance to turn the tables upon their opponents. They had the stronger resources on the spot, the incomparably shorter lines of communication, and during the first two months they succeeded in inflicting greater losses on the Allies than they themselves suffered. By the middle of October this superiority had become so pronounced that they were able to bring in strong reinforcements into Guadalcanal in full daylight and even to land navy guns. But, once again, their constant preoccupation with their need to wage this war " economically " proved fatal. Instead of utilising their initial superiority in order to crush the American foothold on Guadalcanal with concentrated force, they preferred to throw in their forces piecemeal. By the time they had made up their mind to an all-out effort, the opportunity was already past. American command and strategy had changed from a cautious defensive to an aggressive offensive and the balance of power had begun to change in their favour. Thus the strong Japanese drives of the end of October and the middle of November ended in complete disaster, the loss of two battleships, a number of lesser vessels and transports, and some 30,000 men. That was more than they could afford and their heart went out of the struggle, although the final admission of the loss of Guadalcanal was not made until February 9, 1943.

With the simultaneous defeat of its two drives against the Australian lifeline Japanese strategy came thus in the second half of November 1942 to its inner turning point. The first phase of the Japanese War Plan, the phase of the isolation and occupation of the " objective," South East Asia had been achieved. The attempts to eliminate or neutralise beyond that the bases from which the Allies could launch their counter-attacks, had on the other hand, not been uniformly successful. Singapore, Java, the Philippines, Guam, Wake, and the western Aleutians had indeed been captured. But Chinese resistance had not collapsed despite the cutting of the Burma Road. Australia had not been neutralised. Still, despite these setbacks, the Japanese strategists had good reasons for their hope of bringing off the second, even more difficult, part of their plan—the wearing out of the Allies until they would finally " throw up the sponge " and accept the *fait accompli*. In every direction, except against the Soviet Union, they had surrounded their central area with a broad buffer zone in which to exhaust and seal off the Allied counter-attacks. The mere distances alone, which the Allies would have to overcome in their advances across the Pacific and Indian Oceans, would serve as powerful brakes on their efforts. The jungles of Burma, New Guinea, and the Solomons, which the Japanese had barely been able to penetrate, would prove even more formidable to white troops not accustomed to live and fight in them. The dogged fanaticism of the Japanese soldiers would, as on Guadalcanal, hold up the Allied advances to the utmost and exact a prohibitive toll for any foot yielded. Finally, the highly developed net of sea and air bases would enable the Japanese strategists to meet any Allied drive with a superior counter-concentration, and form an unbreakable ring around the central area. "No fleet of battleships supported by carrier-based aircraft can successfully attack vital points within the range of Japan's land-based aircraft," assured Radio Tokyo a fortnight after the fall of Guadalcanal, while the Army spokesman, Colonel Yahugi, affirmed that "the innumerable islands scattered throughout the vast Pacific Ocean have become land bases (i.e. bases for land planes), and as a result . . . we hold absolute supremacy within the strategic sphere of these bases." And finally, behind this closely interlocking defensive ring, the central reserve of the battle fleet would stand ready to deal a crushing blow to any Allied force that might succeed in piercing through the outer ring of defences.

Thus from the second half of Novembor 1942 onwards the Japanese strategists regrouped their forces in opposite directions. With the end of the offensive phase the heavy ships, battleships, carriers, and heavy cruisers, were withdrawn from the danger zones to safe areas in the rear. During the next eighteen months not a single one of them was lost by enemy action—although the battleship Mutsu was sunk in Hiroshima Bay by an internal explosion on June 8, 1943. Conversely, the land and air forces, designed to absorb the initial shock of the Allied attacks, were pushed forward into the critical areas. In New Guinea the slow and costly progress of the Allied counter-drive against the remnants of the Japanese force that had menaced Port Moresby from the Gona–Buna area, seemed to hold out to the Japanese strategists such unexpected opportunities for a large-scale campaign of action, that they promptly set to work to develop systematically the hitherto comparatively weak position along the northern coast and to pour in troops. Not even the complete annihilation of an entire convoy with some 30,000 men by Allied planes in the battle of the Bismarck Sea—March 3, 1943—was able to stop them. It was not until the autumn and winter of that year that their system of bases around the Huon Gulf at Lae, Salamaua, and Finschhafen finally collapsed under the blows of General MacArthur's brilliant series of airborne and amphibious operations. In the same manner the simultaneous embittered struggle for the Central and Northern Solomons contributed to lull the Japanese strategists in the comfortable feeling that despite their losses their plan to wear down the Allies was working by no means too badly.

That pleasant illusion was abruptly shattered by the great American offensive in the Central Pacific in the winter of 1943. The unprecedented effort of American shipbuilding had in the summer and autumn of that year begun to bear fruit to such an extent that within little more than half a year the balance of the opposing forces, which during the Guadalcanal campaign had been more or less equal, had been completely and irretrievably upset. Admiral Spruance's new Fifth Fleet was more than a match for anything the Japanese could throw against him, while its unprecedented concentration of aircraft carriers gave him an irresistible weapon with which to smash his way through the chain of defensive positions which the Japanese strategists had deemed unbreakable. With masses of 800 and soon more than 1,000 carrier planes at his disposal Admiral Spruance was in the position to overwhelm Japanese land-based air forces at any point of their defensive system at which he chose to strike; to isolate key positions; to overcome them under the cover of complete air superiority and of naval bombardments of unheard-of intensity; finally from the new bases thus acquired to isolate and neutralise the remainder of the Japanese positions, by-passed in his advance, and let them rot. Moreover, thanks to the revolutionary system of mobile supply bases simultaneously organised during his first strikes, he was able to overcome as well the logistic difficulties, which up till then had appeared insuperable and upon which the Japanese strategists had counted so heavily, and to carry his advance almost without pause as far as he wished.

So revolutionary was this wholly novel form of superior sea power that the Japanese strategists were unable to grasp immediately its significance and implications. So little did they realise at first what had happened, that they failed to perceive even that the capture of the Gilberts had inaugurated an entirely new line of attack; they were inclined to consider it merely as a flanking operation for the simultaneous continuation of the Allied drives through the Solomons and through New Guinea. The much publicised losses of the Marines at Tarawa contributed to maintain them in the delusion that everything was still going "according to plan," and that their outposts were successfully carrying out their mission to wear down the "impetus" of the Allied counter-offensive. Even the incomparably less costly capture of Kwajalein in the Marshalls was not yet enough to arouse them to the realities of the situation. It was only when after that capture Admiral Spruance struck with telling force at their great naval base at Truk, so long the centre of their operations towards the south-east, that they awoke with a start to the fact that their entire war plan had been irretrievably shattered in the course of exactly three months, from mid-November 1943 to mid-February 1944.

For the fall of the Japanese key positions in the Gilbert and Marshall Islands meant more than merely the breakdown of their outer zone of defence. It meant nothing more nor less than the collapse of their entire strategic system. That system, as we have seen above, rested both in its offensive and defensive phase upon a division of functions between two complementary elements: on the one hand the advanced land, sea, and air forces and on the other the central reserve of the main fleet. In this division of functions the rôle of the "expendable" advanced forces had been not only to defeat and, correspondingly, to hold their opponents, as through 1943; but, if they could not prevent the Allied counter-attacks from breaking through, to act at least as "shock absorbers"; that is, to weaken them to such an extent as to give the Japanese main fleet a favourable opening for a devastating counter-stroke. Thus when the advanced forces failed not only to hold Admiral Spruance, but even to weaken him appreciably, they broke down not only in themselves, but in their fall fatally compromised the power of intervention of the central reserve as well. For without their action as shock absorbers the Japanese main fleet was no longer strong enough to oppose Spruance with any prospect of success.

Thus, through the breakdown of the indispensable shock-absorbing action of their advanced forces, the Japanese strategists had virtually, if not yet *de facto*, lost the command of the western Pacific which they had gained at Pearl Harbour and Kuantan. Deprived of that indispensable complement, the powerful fleet which they had preserved so assiduously against such an emergency, was no longer in the position to meet that emergency. Without having had the opportunity to strike a single blow it had been reduced overnight to a mere " fleet in being," still able to exert some restricting influence, but beset with all the perplexities of such a fleet. Whichever way the Japanese strategists turned they were facing disaster. If they decided to risk their main fleet in trying to stop Admiral Spruance, the probability was that they would be defeated and throw away at one blow whatever restrictive influence they were still able to exercise on his actions. If, on the contrary, they continued to keep their fleet " in being " they would be unable to prevent him from rolling up their positions one after another and would in the end find themselves forced to oppose him under even more unfavourable conditions.

Faced with this dilemma the Japanese strategists were unable to make up their minds either way and tried to wriggle through between its two horns. Twice in succession, at the American approach to the Marianas and again to Leyte, they did throw in their main fleet in a desperate attempt to stop them ; but each time with so divided a mind, so unwilling even at this stage to commit it wholeheartedly, that they threw away their best forces to no purpose, while saving the remainder merely for the ignominous fate which overtook them in the great carrier strikes of March and July of the following year.

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A most significant illustration of that vacillation between the two conflicting aims of preserving and using their main fleet is to be found in an interview given by the Japanese naval spokesman, Ito Masanori, on July 26, 1944, midway between the battles of the Philippines and of Leyte Gulf, to the effect that any plan for a naval battle must always counsel the necessity of preserving one's forces for a subsequent encounter, and that the main force should under no circumstances sacrifice itself, however heroic that might be.

The failure of the Japanese main fleet to stop the American offensive in the central Pacific marked the end of the second defensive phase of their original strategy, just as their withdrawal from Guadalcanal had meant the end of its first offensive phase. In so far as the battles of the Philippines Sea and of Leyte Gulf sealed their inability to prevent their opponents from rolling up their sea empire, it was the real decision of the Pacific war. In 1904 a similar defeat of Togo's fleet would have meant the immediate collapse of the entire Japanese strategic position. But in 1944 the new instrument of air power in conjunction with the incomparably larger distances and areas seemed to hold out to the Japanese strategists a slim chance to drag out the conflict and escape complete disaster.

As the American offensive advanced from the scattered Japanese positions at the periphery towards the broad land masses of Japan's basic area, the Philippines, Formosa, and the Japanese isles proper, it ran into areas which could no longer be as easily isolated and in which the Japanese were able to concentrate and manœuvre large masses of land and air forces. If they could utilise these advantages to slow down the American offensive they might still be able to make it so costly as to secure something better than unconditional surrender.

Thus, although with the battle of the Philippines Sea Japan had lost not only her original war plan, but the War, the conflict went on for another year. Strategy in the sense of a clear reasoned plan finally came to an end when the hope of arresting the American offensive by concentrated masses of land forces and planes broke down in its turn in the long, hard, and brilliant campaign for the Philippines. But dogged fanaticism and sheer despair still kept the Japanese strategists struggling on, although the end could no longer be in doubt, until the atomic bomb induced the Emperor to bring the senseless struggle to its conclusion.

What strikes one most, in retrospect, about the Japanese strategy is its contrast to Adolf Hitler's. Both ends of the Axis erred fatally in their calculations. But they erred in a totally different spirit and, so to speak, "in opposite directions." Adolf Hitler deliberately provoked the war against Poland out of an exuberant feeling of superiority in order to exploit it while it lasted. He realised that he could no longer hope to achieve further successes by the mere show of force alone; but he was confident that he would be able to control the conflict which he so rashly unleashed and to carry through his war of aggression in a series of isolated "episodes." When that calculation broke down after the Polish campaign and he found himself irrevocably committed to an "unlimited" life-and-death struggle, which he had desired to avoid at all costs, he saved himself only by the continuous success of his daring strategic improvisations in Norway and in the west. This series of victories achieved against the considered opinion of the General Staff temporarily extricated him from the immediate consequences of his error, but ultimately proved his undoing by confirming him in his strategic megalomania and incoherent dreams, while none of his military advisers were any longer in the position to contradict or restrain him effectively.

At first sight the outlook of the Japanese strategists might appear not too dissimilar. They too deliberately unleashed their struggle against Great Britain and the United States. They too did so in order to exploit a temporary superior preparedness. But the spirit and motives behind these superficial similar actions were totally different. The Japanese strategists, as we have seen, were driven to them not by a frivolous optimism, not by the desire to grasp an easy triumph, but by fear and apprehension, as the only way out of the steadily more difficult position into which they had been manœuvring themselves ever since the "Chinese incident." So little confident did they feel of success, that their elaborate planning served first and foremost the purpose of convincing themselves that they had a fighting chance to win through, provided they planned carefully and did not let themselves be drawn into any adventure beyond their means.

Compared with Hitler's complete lack of a general plan, reckless improvisations, irresponsible fits and moods and mulish refusal to acknowledge reverses, their careful preparation, adherence to their general idea of a "limited war" and planning not only for an initial *blitzkrieg* but for a prolonged test of strength to follow it, impress one as incomparably more sober. And yet, these plans which they themselves felt to be so clear and moderate, so much in accordance with all the lessons of their past experience, were in reality based upon a complete and profound misunderstanding of the entire situation, political no less than strategic. The successes of their predecessors in their wars against China and Russia had been due to their skilful exploitation of the one-sided superiority enjoyed by a power "commanding the sea" over an opponent temporarily excluded from that element. Both China and Russia had been primarily land powers, and once defeated had been totally unable to make good their naval losses and to break the iron ring which the Japanese strategists had drawn around their objectives. In the autumn of 1941, however, the Japanese strategists decided to pit themselves not against two land powers, but against the two strongest sea and industrial powers of the earth whom, despite all temporary successes, they could never hope to exclude altogether from the sea and to prevent from coming back, sooner or later, with crushing superiority. In other words they were setting out no longer to impose by sea power a " limited war " upon land power, but to impose it upon intrinsically *superior* sea power. Their one hope to redress that adverse balance lay in the shock-absorbing action of the tremendous distances, which the Allies would have to overcome in order to strike back at them, coupled with their ring of advanced air bases. When that broke down in the winter 1943–44 under the blows of the new concentrated sea power, their entire strategic plan collapsed like a house of cards.

Their error, however, went even deeper. Their former conflicts with China and Russia could be limited strategically, because they were limited politically ; because to both China and Russia the issues at stake were but of peripheral interest ; of interest, moreover, only to the ruling groups, not to the peoples as a whole. Thus these ruling groups were unable to put into the struggle anything like the total force of their empires and when the decision went against them, were ready to accept even a disadvantageous settlement rather than to prolong a struggle which was beginning to fan the smouldering fire of internal discontent into open rebellion. On the other hand, even if a great part of Britain's and America's forces and their attention was for the time being absorbed by the struggle against Hitler, the Japanese strategists could never hope to exclude them altogether from the sea and prevent them from coming back, sooner or later, with crushing superiority. All these political and psychological aspects the Japanese strategists of the second World War ignored. Developing their plans upon a purely strategic level, they misjudged fatally not only the temper of their opponents as well as the tremendous psychological repercussions of the attack upon Pearl Harbour, but above all the imperative necessity for the closest correlation between their political and their strategic conception of the conflict ; with the result that they gave the war, which they were endeavouring to carry through strategically as a " limited war," politically the character of an " absolute " life-and-death racial struggle.

Clausewitz, the great German military thinker, said in his last statement that the first, the greatest, and the most decisive act of judgment which a statesman or a commander is called upon to perform is that of correctly appreciating the nature of the war which he is about to unleash, so that he may not take it for something or try to make it into something which in view of the circumstances it cannot be. That is the first, the most comprehensive task of strategy. We have seen how completely Adolf Hitler ignored that advice. The Japanese leaders on their part sincerely flattered themselves that they had followed it. But beneath the deceptive logic of their reasoning they had fallen exactly into that pit of which Clausewitz had warned. They had embarked upon a struggle for which they had not the strength, and had concealed this to themselves by trying to make it into something which by the nature of the circumstances it could be neither politically nor strategically—a " limited war."

HERBERT ROSINSKI.

CHAPTER VIII.

AIRCRAFT IN NAVAL WARFARE.

THIRTY-FIVE years ago the possible use of aircraft in naval operations began to be studied, and a small number of young naval and marine officers were taught to fly. From the very outset, it became obvious that aircraft had no small potentialities in this form of warfare as well as in land operations, and the last war saw notable developments both in material and technique; it also saw the foundation of a very large new arm of the Navy, the Royal Naval Air Service.

As we shall recount in these pages, the earlier developments were not, however, entirely conclusive; the aircraft of that day had not in itself reached a sufficiently perfect stage to ensure any rapid progress in its application under the exacting conditions of naval warfare. Amongst other directions in which its design was still backward was in the precision with which an aeroplane could be controlled in landing. Nor had the science of airflow over a ship's decks, and other matters governing the landing of aircraft on a moving platform, been sufficiently far advanced for the satisfactory development of decklanding. Thus the operation of aircraft during the 1914–18 war was almost entirely confined to seaplane work and sorties from land bases.

These limitations, perhaps more than any others, retarded the specialisation of air operations for naval warfare, and severely restricted the interest of naval officers in aviation. Progress at this period was such that the importance of air operations to the Navy could not clearly be seen. The outcome was that in 1918 the Royal Naval Air Service ceased to exist, and the Navy's needs were catered for by the newly formed Royal Air Force.

During the succeeding years, however, while such great advances were made in carrier development that the operation of aircraft with a fleet at sea became a relatively normal matter of routine, progress in the development of naval air tactics did not keep pace. A somewhat clumsy organisation grew up, in which the specialists in aviation had no training in the other ordinary aspects of naval warfare. The unhappy effect of this circumstance, which was not limited to a general delay in tactical development, could not be better appreciated than by taking a glance at the contemporary technical progress made in the United States Navy, where the air personnel and organisation had never been other than purely naval in character. The inclusion of some naval officers as pilots with Air Force units embarked at sea only partially mitigated the fundamental disadvantages of our system.

By 1937 the inaptness of the existing arrangements became so apparent that a partial constitutional change was again made, and the original responsibility for that part of naval air warfare which was concerned with aircraft operated from ships was resumed by the Admiralty. For administrative reasons the application of this change did not become effective until we were on the verge of war, and, because of the time lag in indoctrinating personnel as well as in changing designs, its full effects are only just beginning to be realised.

Developments in air warfare at sea during the second world war have been far more rapid and comprehensive than in the whole previous 30 years; they may now be said almost to govern naval strategy and tactics. The aircraft carrier has become the core of the Fleet and grouped around it we may expect to find the major part of all future naval activities. It is the purpose of this article to trace such developments from their origin to the present day, and in doing so, to describe the nature of air operations at sea which differentiate them from those of land warfare, and to give at the same time, some account of the proportions and nature of the shore organisation which is demanded for the adequate support of this specialised arm, now again a part of the Navy.

EARLY HISTORY.

It may be of some interest to note here that it was primarily in the search for the best means for obtaining early warning of the movements of the enemy at sea that the lighter types of warship were developed in the past. Nelson pleaded for frigates and ever more frigates for reconnaissance, because they could be built to sail faster than his ships-of-the-line, and bring him news of the French in time for his main fleet to force action.

It was mainly with reconnaissance in view that the Navy purchased its early aircraft and trained their pilots. The Army did the same, clearly with the same object in mind, but the differences between the duties of the naval and military reconnaissance pilots were in those days the same as they are to-day, namely, that to find and identify ships and know what they are doing or are likely to do at sea, requires training in certain aspects of naval warfare, and to find and identify military formations and appreciate the significance of their presence requires a corresponding military training. Those first naval pilots, who learned their flying at Eastchurch, and later at the Central Flying School on Salisbury Plain (where army pilots were also taught), acquired little more in their school training than the elementary knowledge of the time in the art of keeping an aeroplane in the air and bringing it back safely to earth. But even in those early days specialisation began to appear; this was, for the naval officers, mainly a matter of handling aeroplanes on floats, and for that they made their own rules. Knowledge of seamanship was one of their main guides in this technique. In respect of their operational duties, their original training in their own service was at that time regarded as sufficient, and all the warlike aspects of those duties they developed with a sailor's eye.

During the last two years before the 1914 war, the naval air service investigated flying from platforms on the decks of warships; and a naval gunnery officer was attached to this branch to study the possible equipment of naval aircraft with offensive and defensive weapons. Experiments with machine guns, bombs and torpedoes were carried out at this time.

At the start of that war a great deal of progress had been made in the organisation of the naval air service; it possessed several air stations and over a hundred aircraft as well as a large number of pilots recruited either directly from civil life, or by specialisation from the regular ranks of the Navy. Direct recruitment was perhaps a mistake, as it undoubtedly contributed to a process which led finally to the separation from the Navy of this its first air arm. A lack of foresight alone was not the cause of the error; enthusiasm to develop as rapidly as possible such a promising new addition to our naval strength, in anticipation of the impending struggle with Germany, forced it upon the Admiralty. Had there been time for more deliberation, the growth of the organisation might have been slower; but it would almost certainly have been achieved by an increase of the entries for ordinary naval training, and the new personnel would have started their aviation careers with a more adequate knowledge of the general principles and features of naval warfare. This must, in turn, have prevented that lack of sympathy and understanding between the R.N.A.S. and the personnel of its parent service, which held back both technical and tactical development.

This (1914) war provided some very early examples of the advantages of aircraft in naval operations. On the East African Coast the small German cruiser Koenigsburg, after several successful attacks on our ships, eluded the naval searching forces and escaped up the Rufiji river, in territory then still held by the enemy. It was a naval reconnaissance seaplane which located her, and finally brought about her destruction by guiding the indirect fire of monitors stationed at the mouth of the river. Torpedo attacks successfully carried out by naval aircraft in the Dardanelles campaign were another very early and promising indication of the possible developments.

At this period, however, the aircraft itself was neither robust enough nor reliable enough to make its presence really felt in naval warfare, except in coastal reconnaissance. In that field its presence may well have been timely enough since the active operations of German submarines close to our coast, especially on the Channel and North Sea shipping waters, had then begun. Naval aircraft patrolled these areas and must certainly have had a deterrent effect on the U-boats, but here again the patrols were not by any means reliable owing to the climatic and personal factors. The former limited their operation to favourable weather, and the latter arose because in a growing proportion of the sorties the watchers had inadequate naval knowledge for the execution of their tasks.

The naval authorities at this time were hoping for better things, and every effort was being made to push on with the development of flying from aircraft-carrying ships accompanying the Fleet. In the very notable instance of the prelude to the battle of Jutland, we have a solitary example of any form of fleet work being done by an embarked naval aircraft. But even in this case the Engadine's seaplane, though it certainly detected and made the first air report of the presence of the enemy fleet, was unable to follow up this reconnaissance because the increasing height of the sea prevented a second " take off "; vital information of the enemy's strength and movements were not obtained until visual contact was later made by surface ships.

Some progress was also made in meeting the specialised problem of providing fighter defence for the Fleet at sea against the activities of Zeppelins, particularly in order to impede their use for German naval reconnaissance during the North Sea sorties of the Grand Fleet. Experiments were made in the flying off of small fighters from flat-topped barges, towed at high speed by destroyers, but these were not successful, owing to the hitherto insufficiently understood difficulties of the problem, and the aircraft were lost. During the last year of the war, however, many battleships and cruisers were fitted with platforms which provided short runways; on many occasions fighters of the " 1½ strutter " and " Camel " types were flown off when the fleet appeared to be threatened. The aircraft, however, could not be recovered intact, and were obliged to ditch near friendly destroyers, who picked up their pilots, very much as was done in the C.A.M. ships in the early days of the second world war. Operations of this kind were limited, therefore, to the smallest and lightest types of aircraft.

The direction in which probably most progress was actually made by the Admiralty was in the development of large flying boats for extending the range of naval air reconnaissance. These craft reached a considerable size and represented one of the greatest achievements of the time in any branch of aircraft construction. They were capable of long oversea flights, were well equipped for navigation and communication with warships, or the shore, and were defensively armed. Experiments were even made in the launching of a fighter from one of these aircraft.

In the construction of lighter-than-air craft much progress was also made during the war. Rigid and semi-rigid airships were developed by the Admiralty and this commitment remained, in fact, a naval responsibility for several years after the transfer of the other aircraft to the Royal Air Force in 1918.

The experiments in deck-landing carried out on the deck of H.M.S. Furious (originally a cruiser) were of great technical interest and from them the principles, applied later in the design of our first aircraft carriers, were derived. But this development came too late to provide war experience of operating aircraft with a fleet, and the first world war ended before any important specialisation of air work for naval duty had taken place. At that date public opinion, and even naval opinion, saw little in the events of the war to justify the growth of a separate air arm for naval warfare, rather in fact did it see much in support of the contrary view, namely, that technically, aircraft operations over land and sea were alike, the simple act of flying being in itself a specialisation of sufficient difficulty and importance to demand its complete separation from the Navy and the Army.

By the date of the separation, the Royal Naval Air Service had reached an imposing size, and in round figures included nearly one hundred air stations and depots, 55,000 officers and men, and 2,500 aircraft. Had this vast organisation been retained by the Navy until the technique of carrier operation had been more fully developed (another two years would almost have sufficed), and had that large body of regular naval officers then possessing both naval and air experience not been transferred to other fields of interest, then there can be little doubt that many of the most vital problems of naval air warfare which confronted our Fleet at the commencement of the recent war would already have been far nearer their solution than was actually the case. The almost complete liquidation of the Royal Naval Air Service with its vast resources, and the cessation of the support it received from the Admiralty, virtually brought the development of naval air technique to a standstill. During the post-war years the Royal Air Force devoted as much of its effort as possible to naval work, but like the other two Services it was restricted by the necessity for reduced expenditure. The years between the wars were therefore years of constant struggle on the part of naval officers, hampered by their own lack of experience in air matters (and at the same time of the practical means of obtaining it), against the anomalies of the organisation. They were not entirely unfruitful years, however, for though experience was lacking, a fundamental appreciation of the naval problems permitted a study of the possible uses of aircraft; a great deal of hard thinking was done by naval officers on many problems of naval air warfare during those years.

BETWEEN THE WARS.

From the moment that deck-landing in an aircraft carrier became a practical possibility, the employment of aircraft to extend the functions of warships began to take shape. Aircraft suitable for carrying torpedoes and bombs and for oversea navigation and reconnaissance already existed. They had been developed for operation from land bases, but their design naturally needed some further evolution before they could perform those functions entirely satisfactorily when operated from a carrier. Development was gradual, and much of the early effort had to be expended in perfecting and practising the operation of deck-landing itself with reasonable safety. It is not the purpose of this article to trace technical evolution, and it will suffice to say that during the first five years or so after the first world war, progress was made mainly in the field of naval flying pure and simple, and all which that directly involved, the very specialised technique of take-off and landings, the systems and methods of forming up and procedure for return in formation and landing by succession demanded by carrier conditions, and the whole system of signal and wireless communications devoted to these matters. Carrier flying began to distinguish itself from flying from land aerodromes, and required a special technique. This was accentuated when night operating came within the field of practicability.

But while this evolution of the art of carrier flying was taking place, it was becoming daily more apparent that new fields of employment for the aircraft were opening up, which demanded the closest co-ordination with the activities of the ships of the Fleet. Many of these tactical questions had not been studied before; and for solving all of them the qualifications most needed were firstly, the best possible practical experience of the capabilities and limitations of every kind of naval aircraft, and secondly, a sound knowledge of naval warfare and tactics. No one at that time possessed both. The crews of the aircraft were almost exclusively officers of the Royal Air Force with little if any previous experience of naval operations, and hardly a single naval officer now had experience of flying. On this ground, therefore, more perhaps than for any other, the somewhat ideological concept of an entirely ubiquitous air force had to be displaced, and a proportion of naval officers were permitted with the Air Force units embarked at sea. This principle became effective in the first instance about 1921, when naval officers were appointed as observers for the spotting and observation aircraft of the carriers. Later it was extended to include a large proportion of naval pilots, of whom the first batch came to sea again after their flying training, in 1924.

These changes marked a new epoch in the development of naval warfare, and it can be said that this second phase lasted in effect until the outbreak of the second world war.

By about 1934, that is to say, when "navalisation" of the carrier units had been in operation for some ten years, much progress had already been made; and this despite the still youthful average age of the officers now qualified to apply their experience to the problems of both navy and air. By this date, indeed, many captains and admirals had also become closely acquainted with the issues. The list of normal naval functions to which it was believed aircraft could be practically applied was even then fairly well filled. Of those whose character is essentially naval, and which clearly demanded a full degree of specialised knowledge of ships and the sea, the following is a reasonably comprehensive list :—

Naval reconnaissance.
General tactical observation.
Day and night shadowing of ships.
Convoy duty.
Anti-submarine observation and attack.
Target observation and spotting for naval gunnery.
The direct attack of ships (by bomb and torpedo).
The air tactics and movements demanded in carrier operations at sea.

With the exception of the last, all of these are functions which have been and still are performed by surface ships. The sixth and eighth in the above list were the only ones exclusively appropriate to carrier and catapult ship air units.

NAVAL RECONNAISSANCE.

This duty is that perhaps which makes the greatest demand for experience and an accurate knowledge of the appearance and habits of ships. The recent war has also shown examples when an inadequate appreciation of the significance of an enemy naval force at sea has cost us dearly.

GENERAL TACTICAL OBSERVATION.

This function requires a thorough understanding of naval tactics. The observer must, besides being able to assess the general line of advance and speed of the enemy force, also deduce from the tactical arrangement of ships which he can see, any probable additional portion of the force hidden from view, or which owing to the enemy's defensive measures he is unable to reach.

DAY AND NIGHT SHADOWING.

A good knowledge of many sea conditions and a reasonable assessment of the enemy's tactical arrangement are needed in this duty, as well as a high standard of navigational ability.

CONVOY DUTY.

A general knowledge of ships and shipping is not the least of the qualifications required for the efficient conduct of convoy duty. It is now a high specialised function for which special schools have been instituted where co-ordination between all components of the escort forces, both air and ship, is taught.

AIR TACTICS AND MOVEMENTS DEMANDED IN OPERATION AT SEA.

Shipborne air operations are highly concentrated affairs. In the despatch of large formations the greatest degree of co-ordination in take-off, forming up and rendezvous is needed. The smallest errors of timing and navigation can be disastrous. When the operation is a protracted one where successions of relatively small formations are dispatched, accurate co-ordination and timing are again needed in order that carriers will not be kept into wind (and so probably off their course), for longer than is absolutely essential. Some indication of the importance of this co-ordination may be judged from the fact that even when only three carriers are operated in a group there have often been as many as one hundred aircraft airborne at a time; naval aircraft have a relatively short endurance and their landing on again precisely at pre-arranged times is vitally important.

THE SPECIALISATION OF AIRCRAFT.

The functions most generally required of aircraft in naval warfare and the special conditions in sea service were now (1935) sufficiently studied and developed to indicate the lines to be followed in design and equipment. It was indeed becoming recognised that the former practice of adapting for naval use these land types of aircraft whose general dimensions permitted their operation from carriers and catapult ships was no longer good enough; new features not normally to be found in contemporary single-engined Royal Air Force aircraft had to be supplied. The requirements can be summarised as follows :—

RECONNAISSANCE AND PATROL AIRCRAFT.

(i) Long endurance was considered to be of greater importance than a high maximum air speed for naval aircraft of all types. This was additionally important for carrier aircraft, as it is a tactical handicap for a naval force if its aircraft carriers have to fly off reliefs at very frequent intervals, because of the turns into wind necessitated on each occasion.

(ii) Reliable radio equipment is of the greatest importance when flying long distances over the sea, as are also good navigational facilities. In land operation aircraft of comparable size, neither the need of such equipment nor the space for it were usually found. Likewise its weight, in land aircraft would not justify the loss of speed involved.

(iii) The observer in naval reconnaissance and spotting aircraft was always obliged to use his compass when reporting positions and movements of the enemy—and this involves specially arranged arcs of view not normally demanded for observation when flying over land.

TORPEDO-CARRYING AIRCRAFT.

The arrangements required were materially different from those used in land-type bombers, both in regard to the actual carrying and release of torpedoes, and also in regard to the equipment for sighting and for control of the aircraft during the attack.

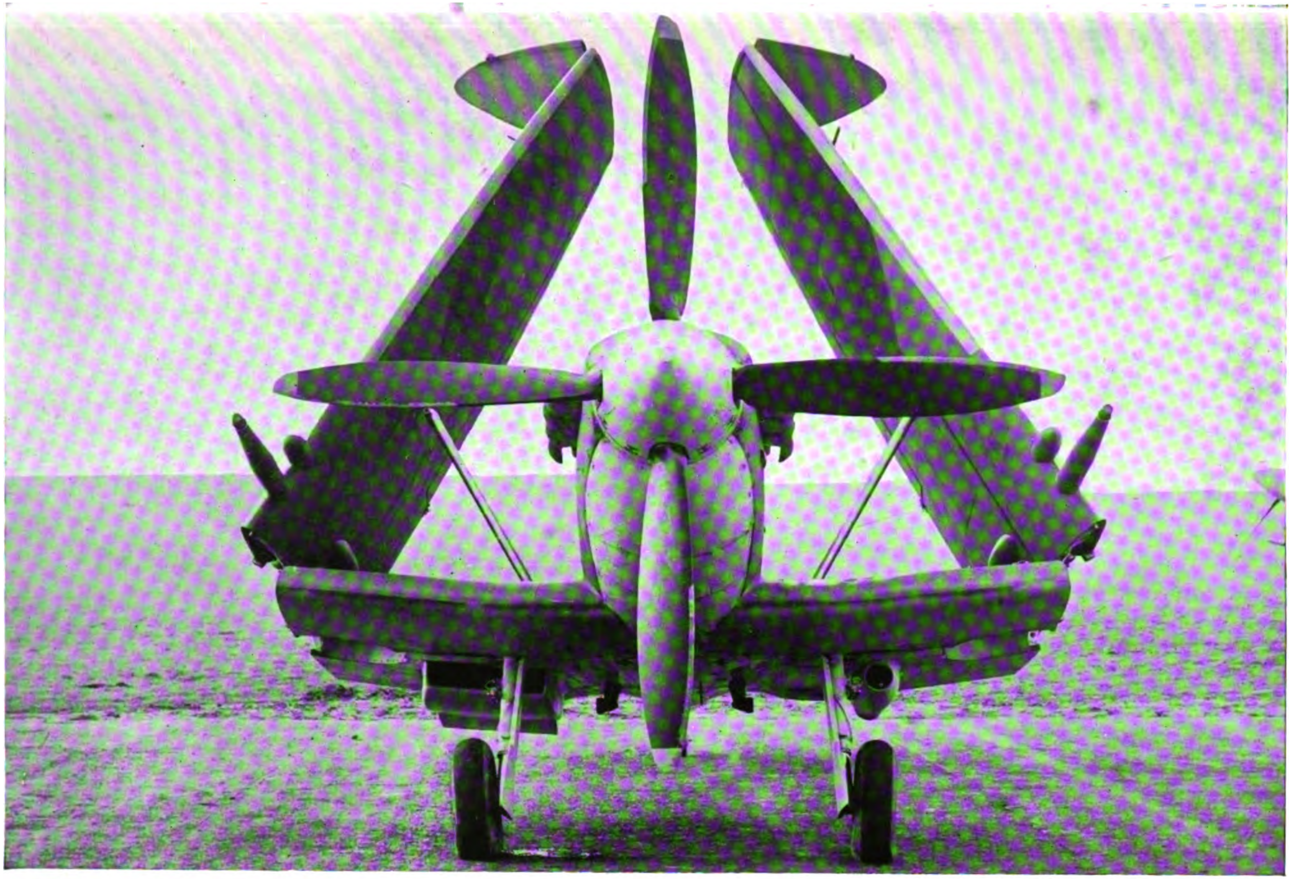
CARRIER TYPES OF AIRCRAFT GENERALLY.

(i) Specialised equipment (including the arrestor hook) for both deck-landing and catapulting were needed, and this also demanded additional structural strength in the fuselage.

(ii) There was a particular requirement in regard to the pilot's view when making the final approach and actually landing on a carrier's deck, which was not demanded in the same way for normal airfield landings.

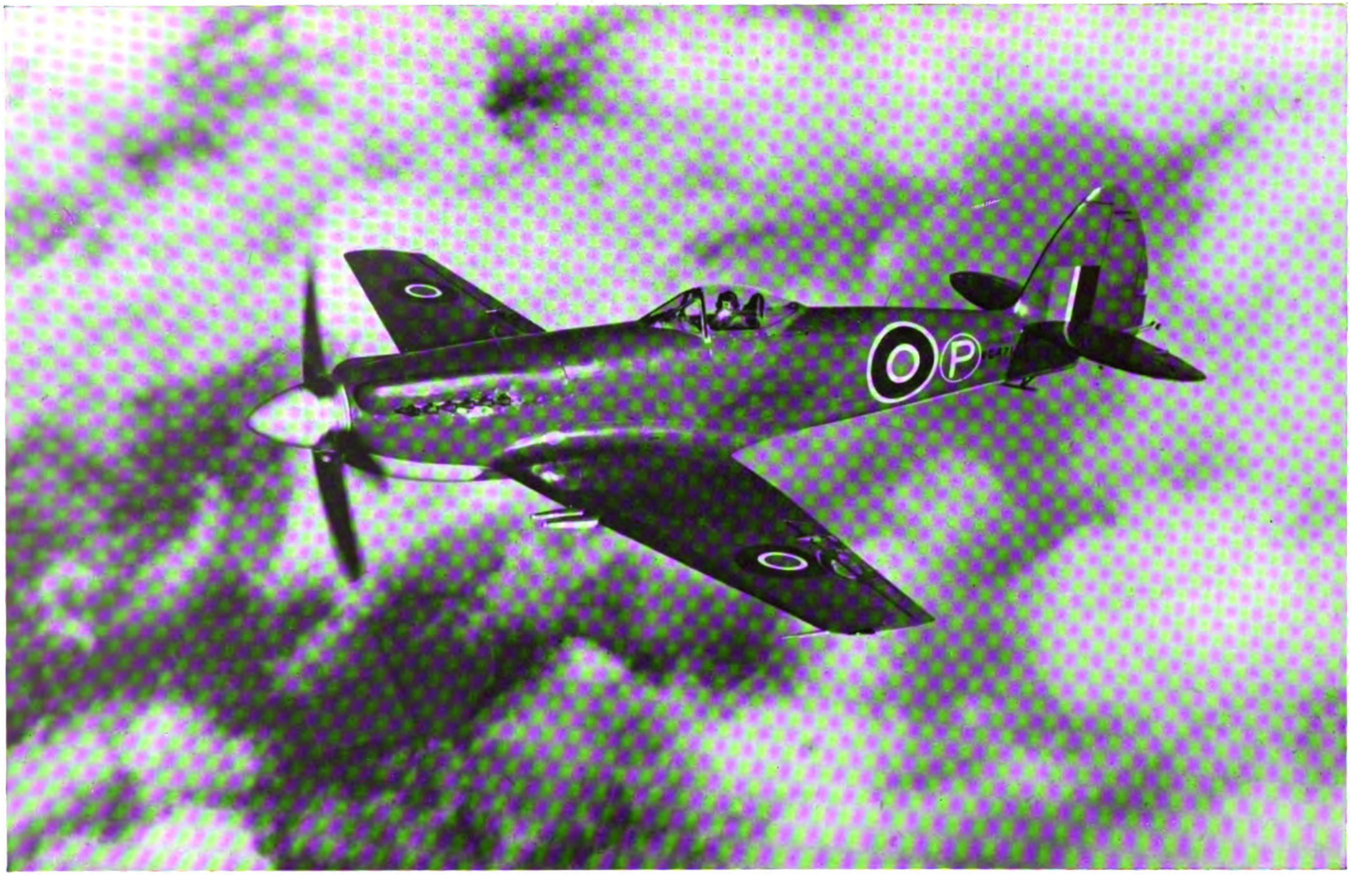
(iii) There was (in peace) a demand that some degree of flotation should be included in a carrier-aircraft's specification. It is a vital matter that when an aircraft is forced to " ditch," time should be available for its crew to leave it safely before it sinks.

(iv) The necessarily restricted size of hangars and lifts in an aircraft



Seafire, Mark III, Fighter, folded for stowage.

(Courtesy of Messrs. Vickers-Armstrong.)



Seafang Fighter.

(Courtesy of Messrs. Vickers-Armstrong.)

carrier imposed certain dimensional limits for carrier-aircraft, and wing folding was generally demanded. These limitations are one of the more important characteristics of carrier types which distinguish them from land types designed for corresponding functions.

True type specialisation for naval work was not, however, at all common in the British service at this date; in the year 1935 nearly all the carrier aircraft were but adaptions from types developed for land use. The standard spotter-reconnaissance aircraft of the Fleet Air Arm, for example, about that time was the *Fairey IIIF*, and this was a true land type; its successor the *Seal*, which was a similar aircraft with an air-cooled engine, was a navalised version of the Royal Air Force *Gordon*. Similarly the Fleet Fighters, the Hawker *Osprey* and *Nimrod*, were purely navalised versions of the Royal Air Force's *Hart* and *Fury*. Torpedo-carrying aircraft were an exception, but in most respects they too only differed from standard land types in relatively minor aspects of general design, to allow them to carry and launch torpedoes.

Hence, at this period, while ample proof existed that naval air work demanded specialised designs of aircraft, little evolution to meet this need had actually taken place in this country. In those navies (United States and Japanese) where progress in the technique of naval air warfare had continued uninterrupted since the 1914–18 war, naval aircraft specialisation was generally much in advance of our own.

SPECIALISATION IN THE TACTICS AND HANDLING OF NAVAL AIRCRAFT.

These marked differences in the functional objects, the operational conditions, and the equipment between naval and land aircraft resulted in considerable divergences in the tactical methods demanded for sea and land warfare. Such differences should, of course, be reflected in the training of the aircraft crews. In most of the functions for which naval aircraft are employed the only satisfactory environment for the training is the sea itself. Moreover, as with all other branches of naval warfare, the widely varying sea conditions and types of operation make experience of them for the personnel take a relatively long time to acquire. Herein consequently lies a further reason for specialisation in naval air work.

It is certainly true that in some phases of naval air operations the tactics demanded closely resemble those employed in the other fields of warfare, as for instance in the case of fighter aircraft for interceptions and air-cover. Against this, however, must be weighed the numerous highly specialised functions involved even in the employment of naval fighters, deck-landing, and carrier group formations, to mention only two. It has in fact been found that the occasions when operational training might be on a common footing for both services are far too few to justify any new attempts being made to apply a general amalgamation of the training effort.

CONCLUSIONS ON PRE-1939 NAVAL AIR PROGRESS.

Progress up to this date could be divided broadly into three phases, of which the first lasted from 1911 (when naval flying first began) until the end of the war of 1914–18, the second from that date until about 1935, and the third from then until the beginning of the last war. The first can be described as marking the development of flying pure and simple, without much distinction between naval and other forms of air operation owing mainly to the non-existence of carrier technique. Apart from the use of flying boats and aircraft on floats, equipment and methods employed were common to both services, nor were there any appreciable differences at this time in the training which the flying personnel received. Many squadrons of the Royal Naval Air Service were in fact employed on shore in France and Belgium for purely land operations.

The second phase, which did not really begin until about 1921 when naval officers first took a serious part in post-war air work, was one in which naval aviation began to find its feet. It was the period not only of carrier and catapult-ship development in the Fleet, but also of the growth of naval air organisations, and of the basic methods of operating carrier aircraft.

The third phase began when, for the first time, comprehensive methods of providing air support for the Fleet began to take shape. In regard to carrier operations it was in fact the period of application of the very slowly gained experience of the preceeding 25 years. By 1935 the first vintages of naval officers with post-war Fleet Air Arm service were beginning to reach responsible positions and apply their experience. The transition between these two phases was marked by the Navy's realisation that naval air warfare was no more than an extension of naval warfare itself, and that in its practice therefore demanded its fullest associations with all other naval activities. When two years later (July 1927) the administrative as well as the operational control of all embarked air units came under the Admiralty, it may be said that the final stage of pre-war progress was commenced.

It was not until this period that full value could be drawn from any of the Navy's former experience, since it was only then that both the design of material and the operational training of its air personnel began to be viewed from the true angle of naval war requirements. It was not, indeed, until the war had already well progressed that this change could show any practical results.

DEVELOPMENTS DURING THE SECOND WORLD WAR.

When war broke out the aircraft available for naval operations and in support of the Fleet belonged to four distinct categories :

(i) Carrier aircraft—of which there were about 200.
(ii) Catapult ship (battleship and carrier) aircraft—about 50.
(iii) Flying boats.
(iv) Shore-based coastal reconnaissance aircraft.

The principal function of almost all of these was naval reconnaissance, a duty which could be carried out for training in peace with a considerable degree of realism. Of the aircraft in the carriers, about two-thirds were of types suitable for reconnaissance, and all of the catapult aircraft were equipped for that duty, as were also the majority of the aircraft in the other two categories named, both of which were under the Coastal Command of the Royal Air Force. Of the remaining third of the carrier aircraft which were fighters, a large proportion were also equipped for reconnaissance, being two seater aircraft.

A proportion of the aircraft belonging to both the Navy and the Coastal Command of the Royal Air Force were equipped for carrying torpedoes, bombs, or depth charges.

It had been envisaged, before the outbreak of war, that the aircraft belonging to the Navy, namely, those embarked in H.M. ships, would meet the requirements of the Fleet at sea, and their employment would be limited more or less to tactical functions in the near neighbourhood of the Fleet. Their training was generally designed to that end. It was assumed that these functions would enjoy a clear demarcation from those of the Coastal Command whose operations would generally include strategical reconnaissance at sea, and the escort of convoys.

The impracticability of adhering to this arrangement, however, soon became evident, and was perhaps one of the earliest lessons which was learned about naval air operations in the war. Ships of the Fleet carrying aircraft frequently accompanied convoys, sometimes because their presence as surface escorts was needed, sometimes because of the closer tactical support which that form of air escort can give, especially, in communications and the transmission of vital orders between ship and aircraft. Again, the reconnaissance functions of the ship-borne and shore-based aircraft frequently overlapped, or alternatively left gaps, sometimes rather serious ones. In short, the fullest co-ordination of effort was demanded between *all* the forces, both air and surface, employed in the maintenance of sea communications, protection of our own ships, and attack of enemy vessels at sea. In recognition of this fact, while no alteration in the general training and administration of the shore-based aircraft to bring them into closer contact with the Navy was made, an organisation was set up for enabling the naval commands, responsible for each sea area, to transmit their requirements directly to the shore-based Coastal Command units concerned.

Many other pre-war conceptions in regard to the practical naval air requirements of a war with Germany, Italy, and Japan were equally wide of the mark, as for example, was the need for high performance fighter aircraft in carriers. Possibly this is one of the biggest lessons of the war, for throughout has come the demand for more and better fighters and the realisation that they are usually a very localised requirement for which (because of its high mobility) no more ideal operating base could be formed than an aircraft carrier. The general balance of the Navy's aircraft equipment has swung from reconnaissance to fighter types, and the relative proportion of these types in the Fleet were revised between the beginning and end of the war.

The use of radar in the detection of enemy aircraft, and in the direction of our own on to an enemy raider, is a sufficiently well-known development to need no explanation here. It is probably the outstanding scientific development of the war both over land and sea, and in this respect a new technique common to both the Navy and the Air Force is involved. On the other hand, its application to the needs of the Navy and to its operation over land differ in a marked degree ; it serves both purposes, but does not cancel out the innate differences between them. It is only, in fact, in those few functions already mentioned, such as fighter interception and air escort duty, which are by nature common in both spheres of operation, that radar itself has a common application. Nor do any of the other war-time scientific and technical developments alter the fact that the value of aircraft employed in the support of naval forces depends mainly upon the extent to which the personnel are trained in naval warfare and understand the sailor's needs, methods, and resources.

In other directions also, pre-war predictions have been at fault. The power of the dive-bomber as a means of attacking ships had been greatly under-estimated, as it also was as an instrument of land warfare. The only aircraft existing in the British service which were expressly designed for and capable of carrying out such attacks in the early days of the war were the Skua (fighter dive-bomber) and the Swordfish. It is perhaps significant of the appreciation by naval officers of the tactical requirements at sea that these two aircraft were among the first used in the post-1918 naval service whose design was produced in response to naval staff demands.

NAVAL AIR BASES.

While their operations are essentially conducted at sea, all naval air units require an extensive shore organisation for their administrative support. During the 1914 war the growth of the shore bases of the Royal Naval Air Service to a formidable size caused relatively little comment in lay circles, since it was known that almost every unit of that service actually operated from the Coastal Stations. In fact, a large proportion of the hundred or so naval air bases of 1918 were operational bases; but the operational technique and equipment of that day was primitive, and the time and facilities needed for training personnel in their use were small. Even in 1915 and 1916 pilots were being drafted to operational squadrons with only a very few solo flying hours to their credit, often less than 20! The fighting equipment, such as it was, would have been explained to them in a few brief words! Between the wars, the time occupied in qualifying a service pilot to join his squadron was increased to about nine months, although later, as naval technique became developed and the art of torpedo and deck-landing were elaborated, it reached a year in duration. At the date when the Fleet Air Arm returned to naval control a naval pilot had usually completed about 150 hours flying when qualified.

Present war-time conditions, enlarged facilities, and far longer working weeks did not effectively shorten this time, since with every month of the war new features of operational technique were introduced, and the aircraft themselves became continuously more complex and sensitive, their handling demanding longer courses and more practice. To-day a fully-fledged naval pilot needs most of two years to complete his training.

The numbers of aircraft and personnel have also been scaled up continuously, in relation to the size of the fleets for which they are provided. This is one of the alarming, but inevitable, consequences of our present state of military and economic evolution. Though a single aircraft fully equipped may cost the country £25,000 it has to be ordered by the *thousand*, while a few years ago it would have been ordered by the mere *dozen*.

This seemingly unbalanced expansion can find its explanation in two causes; one is that the war has taught us to expect far smaller results from small formations or single aircraft than was previously thought reasonable; the other that the conditions of modern naval flying impose a much greater stress on personnel and material than had been generally recognised in the past. There are several reasons for these two conclusions, but briefly they arise because almost everything involved in air operations at sea impinges in a more concentrated form on personnel and aircraft alike than it ordinarily does over the land. The accuracy required in navigation and in signals is far more vital; the targets are generally smaller, harder to find and see, more difficult to hit; the defensive armaments are more concentrated; the timing for all sorties and for return from them is more vital because of the fifty other aircraft also due to return to the same small moving landing-strip; in the final landing the smallest lapse from accurate judgment is inadmissable. So larger numbers must be provided for every operation, and spare formations must be available in all operating areas for ensuring adequate rest for personnel, and the fullest possible maintenance for the material.

The naval pilot now must pass through many more schools than before; his new entry training if a rating, his normal naval training if an officer; his pre-selection and grading; his elementary, service type, and conversion, flying training schools; his operational training unit; his air warfare training unit, his deck-landing training ashore, and finally his carrier deck-landing.

These schools as well as the now enlarged operational strength of the air units make big demands in maintenance and other ground staffs. They in turn need schools; schools for air mechanics, air fitters, and air artificers; schools for flying control and aircraft handling parties; schools for photography and meteorology. Even the medical staffs need specialised training in caring for the health of flying personnel. Efficient administration, the maintenance of proper *esprit-de-corps* and discipline, and variations in technical demands peculiar to naval duty, mean that all of these schools are best if they are naval schools with naval staffs. It helps the rest of the Navy too, to understand air problems when other officers and men find themselves drafted into administrative posts at air establishments.

Again, the storage and repair of aircraft and other air material involves even more establishments and sometimes airfields. The total of naval air bases in all is a big one, and the number of officers and men employed at them and in our air units, is now rapidly reaching a third of the whole Navy. But our aircraft could no more take the air in their proper state of efficiency if the correct number of bases was cut down, than our ships could without naval barracks and dockyards. Air logistics are indeed most disquieting to the taxpayer, but had they been so poorly understood in 1943 as they were in 1938 or even 1940, there would have been no Pacific Victory in 1945.

Logistics were once described as the exaggerated demands of " Q " Staff, after they have been got at by the contractors! But more fairly they might be defined as " facing the unpleasant truths of war." One could hardly see this better illustrated than by the fact that in the Russo-Japanese War of 1904–5 the supplies to the Far East across Siberia never reached their maximum flow until Russian " Q " officers realised that they must destroy all the rolling stock which carried the supplies, manufacturing new trains in Europe for each journey.

SEAMANSHIP AND NAVAL AIRMANSHIP.

The question is often asked, what should a naval pilot be? Should he be a seaman with some knowledge of the air, or an airman with some knowledge of the sea? Perhaps this cannot be answered simply, but the Navy itself now should have little doubt, after its thirty-five years of trial and error with many different kinds, as to the type of man it now needs for the direction and conduct of its air operations. There have been, in both wars, a very large proportion of naval pilots who have entered from civil life for flying duties only. They have been trained primarily in airmanship, specialised to a greater or less degree for naval duty, and they have acquired a naval background from their contacts and associations. These are airmen with some knowledge of the sea; but they are "naval" airmen. Next there have been the Royal Air Force pilots, who have served with the Fleet Air Arm during the "interregnum" period of 1918–38. Often their naval service lasted no more than a few months; occasionally as much as two years. They can be described also as airmen with some knowledge of the sea; but they were not "naval" airmen, because their basic training was not naval. Thirdly, there have been the pilots trained initially as naval officers and men; they are the sailors with some knowledge of the air; they remain with the sea service. It has been upon them that the Navy has been able to place its greatest reliance, because of their accumulating experience of both sea and air, and because of their permanency in the naval service.

The whole truth of that is that naval warfare now demands a specialist branch for aviation, which will resemble in every principle the other specialist branches. It must be officered by those who have a thorough naval training, and whose specialist training must also be entirely complete and adequate. Thus only as with the other specialist branches of the Navy can leadership and technical direction be taken by officers of the branch: their personal and practical experience in their own branch of naval warfare must be the qualifying factor. The naval pilot, therefore, must be an "air-specialist sailor," for if he is not, there will be no source from which to draw our future leaders in the branch.

The sailor's training is in itself by no means an unsuitable basis upon which to build the air specialist's skill and judgment. As a sailor he learns, in the physical field, to gauge by eye the effects of wind and weather; the relative speed of moving objects; heights and distances. In the moral field, he learns not to be hasty, or over-optimistic; and he is no seaman if he lets himself believe just what he wants to, and not what his knowledge or his instruments tell him are facts. These qualities are also needed in airmen.

The airman's training which a seaman may receive likewise contains much which may polish or sharpen his sailor's wits. In the naval service of 1946 it also contains much which he needs to know properly to understand many important branches of naval warfare. But, of course, a man can be a good sailor without being an airman, though unfortunately there once were some who would have us believe that he could not be a good sailor if he were an airman. During the "interregnum" period this view was occasionally heard in the Fleet, and possibly did harm through the discouragement of officers from specialising in "air." Nothing could be farther from the truth, since most naval pilots of the active service are sufficiently stimulated by their contact with the realities of modern war to possess a very real ambition to higher naval responsibilities, but feel themselves rather handicapped in acquiring general naval experience, owing to the very long periods they have in the past had to serve in purely air appointments.

In the provision of senior officers for appointments holding important "air" responsibilities, up-to-date knowledge and experience of the specialist aspects of the branch must weigh heavily. In the air, technical and operational progress is very rapid, and those who do not retain good practical contact with this branch soon get out of date and their judgment ceases to be reliable. Alternatively, they have to rely too much upon subordinates for advice, which may easily become dictation. The United States Navy seems to have approached this problem with open eyes, for it is observed that two significant measures have been applied which appear to aim at the dual purpose of encouraging their best officers to take up aviation, and of securing the highest possible confidence of the junior aviation personnel in those from whom they receive their operational orders and instructions. These steps have been, firstly, the practical specialisation of all officers who hold responsible air appointments (a law makes this obligatory); and secondly, the acceleration of promotion for executive aviation specialists so that the best can hold the highest responsible air appointments while their experience is still ripe.

It is believed that few people realise how much greater has been the influence of aviation upon the trend of naval warfare, during the past six years, than its influence upon the trend of military operations. The Army has undoubtedly revised its equipment, and many of its tactical methods, but the infantryman has always been the final argument, be his means of locomotion what it may, and artillery for many generations has been his principal support.

The centre of gravity of the whole Navy has, however, been moved by the development of airborne weapons and the changes in naval tactics have not been merely those which would naturally follow a change only in equipment. The carrier with its air component is now likely to become the principal naval fighting unit, and it is therefore around the formerly obscure air branch that the impending changes of the future, both in equipment and tactics, are bound to revolve.

This war has been the young man's war, not the man just young in years, but young in ideas and fresh in experience; and the air branch is " in excelsis " the branch of the young man. Nor is the age going to let the other specialist branches retain any "moss" they may have been in danger of acquiring. *Kamikaze* bombers, long range rockets (with or without " atom " heads) and the startling progress of electronics are seeing to that. As with the operations of the air, so also with the other branches of modern naval war, decisions can, even now, rarely await staff consultations.

There will in the future be one standard criterion of fitness to hold operational command, and that will be, to have an up-to-date practical experience of the equipment, tactical methods, and general conditions of naval air operations. At the present day, this qualification is held only by a few of the more senior officers of the Navy; and the history of the past 35 years can supply the explanation of this. But thanks to the maturity which is now being reached by the air arm and to the new policy of training, the Navy should before long have no difficulty in finding as many fully qualified in this respect as it needs. Every naval officer will, in fact, then possess a reasonable working knowledge of the functioning of this branch.

" VOLAGE."

CHAPTER IX.

THE ROYAL NAVAL AIR SERVICE, 1912–1917.

CAUSES AND RESULTS OF ITS ABOLITION.

In 1911, growing tension between France and Germany forced the British Government into tardy realisation that considerable progress in flying had been taking place on the continent—in France and Italy chiefly by means of aeroplanes, and in Germany more especially by means of airships—and there was the clearest evidence that development in all these countries was being fostered primarily for military purposes. Under the shadow of war the Government decided to form a British Aeronautical Service to be composed of two flying wings, one to meet the needs of the Navy, and the other the needs of the Army: a central flying school to serve both the wings, and a Permanent Air Committee to deal with all aviation affairs concerning the Admiralty or War Office. Such an organisation would indicate that the first intention was to create an Air Service separate from either Navy or Army but serving the common needs of both. The realities of divergent requirements quickly modified that academic conception.

The aeroplane, sufficiently developed to be usefully employed in military operations, had not reached a stage of technical development to allow of it working at sea with the Fleet. Therefore, though its future in land warfare was reasonably clear, its future in naval operations was more obscure. By July, 1914, fundamentally differing requirements had caused the naval elements to separate from the military and to form the Royal Naval Air Service, complete with its own supply and training organisation, but dependent for technical progress mainly on the resource and enterprise of private industrial firms.

The Military Wing, retaining the various established organisations for research development and training, continued as the Royal Flying Corps. Thus by the outbreak of war in 1914 naval aviation was already integral with the Navy, and military aviation with the Army.

DEVELOPMENT IN THE R.F.C.

From the military point of view, the primary purpose of the aeroplane was quite obvious. It was a vehicle which could go faster and farther in a given time than any other, moreover, it was immune to obstacles. It was therefore the best instrument for obtaining information. In consequence, the evolution of air power within the Army during the four years 1914–18 was simple. The aeroplane was used first as an unarmed vehicle for general reconnaissance—out of general reconnaissance grew a specialised form of reconnaissance, artillery observation—then came the employment of low-flying aircraft to observe and maintain contact with our own troops as they moved in the fighting line. Even the small fast aeroplane, the fore-runner of the modern fighter, was evolved as the "Scout," a fast single-seater reconnaissance machine, whose high speed was to enable it to work in strong winds against which the slower two-seaters would be unable to make headway.

Very early in the 1914 campaign, however, it became obvious to both sides that the value of air reconnaissance was so great that he who could employ it while denying it to the enemy would be in a position of incalculable advantage. Therefore, steps were taken first to interfere with and then to protect the reconnaissance aeroplane. In this way air fighting began to develop and the function of the " Scout " began to alter. From reconnaissance its rôle changed to fighting, fighting to protect the information-obtaining aeroplane—general reconnaissance, photographic, artillery observation, or contact.

Once aircraft found themselves possessed of the power to strike, evolution from mere contact observation to direct intervention by means of machine-gun fire was inevitable, as was the employment of the small manœuvrable Scout for tactical bombing. The bigger aeroplane carrying the bomb to deeper ranges only appeared comparatively late in the war, and it is questionable if the claim that this long-range bombing had a decisive influence on the war can be substantiated.

The functional evolution of air power is clearly revealed in the changing proportion of types which went to form the Royal Flying Corps at critical times throughout the war. On August 30, 1914, when air reconnaissance discovered the alteration of direction in Von Kluck's movement, all four aeroplane squadrons of the R.F.C. in France were general reconnaissance squadrons. In the following month, during the battle of the Aisne, reconnaissance took a specialised turn, and air observation with wireless control of artillery was introduced by one squadron.

Then came the period May, 1915 to February, 1916, when the Fokker fixed-gun fighter drove home the lesson that every bit of information sought by reconnaissance would have to be fought for ; we were then compelled to send out every reconnaissance aeroplane escorted by never less than three, often more aeroplanes, whose duty was simply to fight in protection of the reconnaissance aircraft. This was the beginning of formation flying and defensive fighting, and the condition continued until we could produce a special fighter to cope with the Fokker in the spring of 1916. At the Battle of the Somme in July, 1916, reconnaissance went a step further, when a regular system of low-flying contact patrols was practised in order to keep track of the constant fluctuations of the fighting line.

By this time both the function and the demarcation of types were becoming distinct. During the Somme battle, out of a total of 27 R.F.C. squadrons, 14 were single-seater Scout type whose function was primarily fighting in the air, and the remainder were reconnaissance and observation. By April, 1917, of the 50 R.F.C. Squadrons in France, 27 were fighters, 21 were reconnaissance and observation, and 2 were bombers. In July of that year the fighter type was for the first time used on a large scale as a fighter-bomber for the attack of enemy aerodromes, followed in November of that year by the use of the fighter as a low-flying attack aircraft, working with tanks and infantry during the battle of Cambrai.

In March, 1918, came the great test of flexibility in function when, during the German break-through between the 3rd and the 5th British Armies, every fighter in the vicinity was switched on to low-flying attack in support of the forces on the ground. It is perhaps pertinent to observe here, that, while low-flying attack contributed largely to the checking of the German advance, the longer-range bombing of the bridges at Le Catalet, Vendhuille, and Honnecourt, was ineffective. It was about this time also, that the fighter was used to attack and neutralise anti-tank guns, immediately preceding the launching of the tank attack.

In October, 1918, out of a total of 57 squadrons there were 27 fighter, 4 fighter-reconnaissance, 13 reconnaissance-observation, 7 day-bomber and 6 night-bomber squadrons. The proportion of fighter to Army-co-operation types was now more than two to one and the scope of the fighter had progressively been extended till intervention in ground fighting was as normal as fighting in the air.

This spectacular increase in fighter strength began to cause an inversion of thought as regards the relative importance of air fighting and the various facets of Army co-operation. Fighter superiority was confused with air superiority, and success in the fighter contest was being accepted as the final aim instead of the means to the end. Foch, on assuming command of the Allied Forces in April, 1918, checked this tendency by means of a masterly *directif* which stated: "The essential condition of success is the concentration of every resource of the British and French bombing formations, on such few of the most important of the enemy's railway junctions as it may be possible to put out of action with certainty, and to keep out of action. The first duty of the fighting aeroplanes, is to assist the troops on the ground by incessant attacking with bombs and machine guns on columns, concentrations, and bivouacs. Air fighting is not to be sought except as far as is necessary for the fulfilment of this duty."

DEVELOPMENT IN THE R.N.A.S.

There is a general feeling, amounting almost to conviction, that the R.A.F. was formed because the Navy and the Army failed to play their part in the development of air power. An unbiased and dispassionate survey of the march of events from 1912–18 will not reveal any foundation for such a suggestion.

Making due allowance for the inevitable limitations imposed by technical factors, the absence of any practical knowledge of aerodynamics and dependence on unreliable engines, the survey in the preceding section shows clearly enough that the aeroplane was absorbed progressively, surely and decisively as an essential part of the organisation of the Army. An equally analytical examination into Naval aviation before 1914 and during the war years will yield no evidence for the suggestion that development of air power in the Navy was any less vigorous or less effectively directed than in the Army. On the contrary, the Navy appears to have been consistently ahead of the Army, both in technical development and in adaptability to new conditions. Progress was perhaps less apparent because, by 1914, nowhere in the world had either the aeroplane or the internal combustion aero-engine reached a stage of efficiency which would permit of it fitting readily into the pattern of fleet operations, where dependability was essential for long-distance overseas fights. Furthermore, while the acquisition of even the early aeroplane was pure gain to the Army entailing no sacrifice in its adoption, the same by no means applied to a fleet which could only carry aircraft at some expense of fighting efficiency, or with an actual loss of fire power. Therefore, before the aeroplane could be acceptable to the Navy, the positive gain in reconnaissance or protective value had to be real and obvious to offset the known loss in gun power.

Finally, technical evolution in the sea-going branch of Naval aviation had to move simultaneously along two basic but inseparable lines of development in order to bring aircraft into the category of a new and serious factor in naval warfare. The first was that of the aeroplane itself for the special conditions in which it would have to operate; the second that of the mobile base which would enable the aeroplane to come decisively into action at the right time and place. The rudimentary state of aeronautics at that time made progress in both spheres slow and, even by the end of the war in 1918, the technical development of carrier and aeroplane had not advanced sufficiently to put air power in relation to fleet operations on the same footing as was air power to land operations in 1914.

It was at this critical point of development in 1918 that the two inseparables were in fact forcibly separated. The aeroplanes became the responsibility of the Air Ministry while the carriers remained that of the Admiralty, and nine years slipped by in argument, controversy, and recrimination, before the major complications of carrier design in respect of flying-on-decks, and the problems, common to both carrier and aircraft, of landing speed absorption had been sufficiently smoothed out to permit of a really wide investigation of the tactical employment of aeroplanes with fleets at sea.

At this point it is necessary to trace the general development of naval aviation. Up to 1914 the Navy was ahead of the Army, both in its realisation of the potentialities of aircraft and in actual development of those potentialities. The explanation of this was quite possibly that the Navy, already a technical service, could find money for technical experiment and development much more easily than the Army, whose sole technical element was more or less contained in the small corps of Royal Engineers, with a traditional allocation of funds, of which the amount had been crystalised by precedent.

The Navy commenced flying training before the Army in 1911, and by the end of 1913, had trained over 100 pilots. In July, 1914, the first exhibition of formation flying was given by the R.N.A.S. at the Naval Review. During this time, a good deal of study had been devoted to the technique of bomb dropping and, early in 1914, all the data in connection with this were placed by the Admiralty at the disposal of the Army.

The problems of operating aircraft from ships had also been tackled. In 1912 an aeroplane was successfully flown from the deck of the battleship Hibernia, and in 1913 the Hermes, accommodating 3 seaplanes, was commissioned as the first aircraft carrier in the world. Perhaps it would be more accurate to describe Hermes as an aircraft transporter, since though she had a platform for launching sea-planes, landing on had not been provided for, nor in fact thought of.

Immediately on the outbreak of war, an anti-submarine airship patrol was established across the English Channel to cover the crossing of the B.E.F. This was then extended to a patrol system to cover the east coast of Britain. From this small beginning grew the vast organisation of "Spider Web" patrols, which was gradually built up until in 1918 it covered the North Sea, the Atlantic, and the Mediterranean, with centres on the coasts of Britain, France, Ireland, Newfoundland, Canada, and Africa. Complementary to this was the system of convoy escorts, which in 1918 covered 7,000 convoys to such good purpose that only six were attacked by submarines. This was only one side of the development of naval air power.

Concurrently with these protective measures at sea, an active and persistent offensive was developed against the nearer submarine bases at

Ostend, Bruges, Zeebrugge, and Antwerp. Bombing attacks, probably quite ineffective with 20 lb. bombs, were commenced at the end of 1914, and continued on a growing scale, and with increasingly larger bombs throughout the war. Simultaneously a bombing offensive was begun against deeply-seated land targets—the Zepppelin sheds at Dusseldorf, Cologne, Frederickshafen, and Cuxhaven—in September, October, November, and December, 1914. The Zeppelins were the eyes of the German Fleet, and these attempts to destroy an integral part of the fleet were a normal part of naval operations.

From the foregoing it is apparent that, due to the immaturity of aviation and aeronautical engineering and under the urge of war requirements, the Naval Air Service developed land-based aircraft more extensively than ship-based. The major part of the experience of the R.N.A.S. was derived from the operation of land-based types, the greater proportion being employed in overseas flying, but a by no means negligible part in long-range offensive operations requiring the use of both bombers and fighters.

It is obvious that the credit for the early development of bombing, and for the conception of long-range bombing attack, is due to the Admiralty and, but for the shortage of aircraft and engines, there is no doubt that the Admiralty might have developed the technique of long-range bombing far beyond anything achieved by the R.F.C. and, in the last months of the war, by the R.A.F. The circumstances which conspired to prevent this are of interest.

At the end of 1916 and in the early part of 1917 the military situation in France gave indications of becoming critical, and the importance of air power in military operations began to receive general recognition. This resulted in an increasing demand for aeroplanes. Simultaneously the intensification of the German submarine blockade necessitated the expansion of the anti-submarine organisation. While demands from both naval and military sources were becoming more insistent, a crisis was occurring in the supply of aviation material, and production was at so low an ebb that demands could not be met.

Upon resources already overstrained, the requirements of Home Defence began to impose themselves. Popular clamour called for better protection against bombing, and equally loudly for reprisals against Germany in the form of counter-bombing. This latter cry found an eloquent echo in the voice of Colonel Barês, the representative of the French Air Service in London, who persuaded the Admiralty not only of the advisability of counter-bombing, but also of the practicability of it. The Admiralty agreed and prepared a project for the attack of German towns, by means of a long-range bomber force, to operate from existing bases in the vicinity of Dunkirk. The plan would have absorbed some 200 aeroplanes, and 1,000 engines, and, on being formulated, drew such bitter criticism and opposition from Sir Douglas Haig and the military authorities, that it was ultimately abandoned.

PRODUCTION AND SUPPLY.

It is obvious from the two preceding surveys that the development of air power, and the conduct of air operations both in the field and at sea, had progressed along logical lines, and in a perfectly normal manner. Yet in 1917 it was decided to extract the air elements from the Navy and Army and combine them into one separate service—the Royal Air Force. The real causes which led up to this are involved and obscure.

With the creation, in May, 1912, of the Royal Flying Corps, various complexities in the supply problem had been foreseen, and in order to cope with the inter-service competition for the meagre amount of available material, a Permanent Air Committee was formed to hold the balance between the Services. In the early stages, provisioning presented a little difficulty. The peace-time consumption of aircraft was small, demands were within the capacity of supply, and few problems came before the Committee. In these circumstances there appeared to be little need for such a body, and it had died of inanition before the real tussle between Naval and Military requirements began. In the stress and pressure of war the absence of regular arbitration caused ever widening difficulties, with repercussions which later will be apparent.

In 1914, on the outbreak of war, there was nothing which could be regarded as an aircraft industry in Britain. Some ten, perhaps twelve, firms, dabbling in aeronautics, were at that time rather more seriously engaged in learning how to make aeroplanes than in actually producing them. As regards engines, the situation was even more rudimentary. There were no firms sufficiently interested to concentrate on aero-engine production and the aviation of this country depended almost entirely on foreign engines, or on private ventures by small firms whose enthusiasm was incomparably greater than their experience and financial resources. It is significant that every aeroplane of the Royal Flying Corps which went over to France in August, 1914, was powered by an engine designed and manufactured in France, and it was not until the last year of war, that engines of British design and make were being produced in sufficient quantities to replace the French designed Clerget, Le Rhone–Hispano Suiza, etc.

The onset of war made sudden and increasing demands on an embryonic industry quite incapable of the swift growth imposed upon it. The inevitable result was that the Department which most clearly knew what it wanted, and was in a position to pay for its requirements, got the pick of a small market. The Admiralty with greater technical knowledge and infinitely more widespread technical resources than the War Office obtained the lion's share of aircraft and engines. This caused a great deal of heart-burning and jealousy in the military camp.

Unfortunately it was the army aeroplanes which went into battle first and suffered the heaviest casualties. The absence of maintenance and replacement supplies underlying an increasing scale of wastage, caused, from the earliest stages, a series of crises in France. This tended to throw into relief the Admiralty's apparent adequacy of aircraft and sufficiency of supplies, while the Army, whose need was pressing and vital, seemed to be incurring defeat for lack of adequate air support. The Commander of the R.F.C. missed no opportunity of using this as a lever to obtain aircraft and supplies which the War Office, through lack of either knowledge or foresight, had failed to provide. For instance, when the Germans had again begun to establish air superiority in October, 1916, Sir Douglas Haig wrote " it is necessary to realise clearly, and at once, that we shall undoubtedly lose our superiority in the air if I am not provided at an early date with means of retaining it." The means of retaining it were promptly provided in the shape of a fighter squadron from the R.N.A.S. A further appeal in 1917 was answered by the allocation of four R.N.A.S. fighter squadrons with reserve aircraft, and engines to strengthen the R.F.C. Similar appeals were similarly met on other occasions.

In spite of these evidences of co-operation, relations between the War Office and Admiralty developed into a wrangle of the first magnitude, and the issue came on to a political plane with this rather unfair twist, the allegation that the Navy had established a stranglehold on aircraft production and was not prepared to share fairly. Here then, was the root of the trouble—basic inadequacy of supplies—urgency of demand—the inevitable advantage enjoyed in a technical sphere by a technical service over an essentially non-technical service, and—ensuing jealousy.

The Permanent Air Committee was resuscitated under the name of the Joint Air Committee, which, however, being a purely advisory body with no executive powers, was quite unsuited to survive in the circumstances of bitter competition into which it had been born. It existed for a few weeks, and then was succeeded by the Air Board, a similar body, but endowed with greater powers. Those powers, however, were insufficient to allow of it exerting any influence as regards the wider policy concerning the use of aircraft. Thus, if the Navy wished to place orders for three million pounds' worth of aircraft and engines, in order to implement a new project of war, as for instance the long-range strategic bombing plan already mentioned, the Air Board had no power to intervene on behalf of the War Office, or to interfere with the manufacturing arrangements. Such control could only be exercised by the Cabinet.

German air attacks on this country exacerbated a situation already fraught with difficulties. The War Office, in whom the responsibility for the defence of London was vested at the outbreak of war, having found itself quite unable to meet the growing requirements of its armies in the field, was less able to meet even the most elementary requirements of Home Defence; but none the less as a matter of principle refused to acquiesce in the Admiralty taking over the whole responsibility. Again the tussle became inter-departmental. The Admiralty, whose responsibility for the air defence of various vital naval bases had forced them to undertake local air defence measures, found themselves being drawn into the general air defence of the country, again by virtue of the fact that they had both the organisation and the aircraft. Commencing in September, 1914, there was dual control and divided responsibility. From now on, the issue grew more and more confused, until it became impossible to elucidate who was responsible for what, and why failure succeeded failure both in the field and at home. Why time after time, starting with the Fokker and its interrupter gear as the first fighter in 1915, and followed by the Halberstadt, the Albatros, and the Gotha, the Germans were so often able to take the initiative and establish a technical lead.

The problem, already complicated in its ramifications as a direct issue between the Admiralty and the War Office, disclosed at an early stage a third angle of difficulty, that of the economics of production. In 1914, the replacement of aeroplanes to the R.F.C. in France, was eighty-five. In 1916 this had risen to nearly eighteen hundred and, if the various projects for expansion had materialised as planned, the subsequent replacement figures for 1917 and 1918 might well have reached astronomical proportions. Even the modest requirements of the early war years demanded a highly specialised technical industry presenting ever-increasing problems in respect of priority allotments of skilled tradesmen, supplies of special raw materials, appropriate machine tools, etc. Such questions required judgment on the highest level, since decisions might well prove to be the concern of the whole industry of the country. To have endowed this adjudicating authority with the further right to implement its own decisions and to hold the balance between the Admiralty and the War Office, would in effect have conferred on one Minister of the Crown powers exceeding those of any other single Minister, excepting the Premier. Such a step was politically unpalatable, so the continuing loss of valuable lives among trained airmen, and even impending disaster to the armies in France, caused little more than a solemn shaking of heads, indeterminate murmuring, and an adroit shuffling of responsibility till the aeroplane raids on London precipitated action.

On June 13, 1917, 14 Gothas, without loss to themselves, dropped 118 bombs in the London area, killing 162 people, and wounding 432, and damaging or destroying 62 buildings. The reaction of the War Cabinet was prompt. It ordered the withdrawal of two fighter squadrons from the fighting line in France for Home Defence duties. It accepted the principle of reprisal bombing, and, in order to implement this last decision, it doubled an aircraft expansion project put forward by the War Office some six months previously. It made this decision apparently oblivious of the fact that the state of engine and aircraft production in Britain at that time gave little prospect of even the original War Office scheme being achieved. The new project of two hundred squadrons made provision for forty long-range bombing squadrons to bomb the enemy in his own country.

A subsequent raid on July 7, 1917, by twenty-one Gothas, caused the Cabinet to meet in a state bordering on panic. Sir William Robertson, who was present as Chief of the Imperial General Staff, wrote, " one would have thought the whole world was coming to an end." The most notable result of this meeting was the appointment of a Committee under the chairmanship of General Smuts, to report, first, on the measures necessary for the adequate defence of London and secondly, on the means to enable the Air Board to deal with policy as well as supplies. It was an astute political move to delegate responsibility for what might perhaps be unpopular or unsound recommendations, to a distinguished stranger, who in fact had no responsibilities in this country and who, therefore, might expect the immunity of privilege if things went wrong.

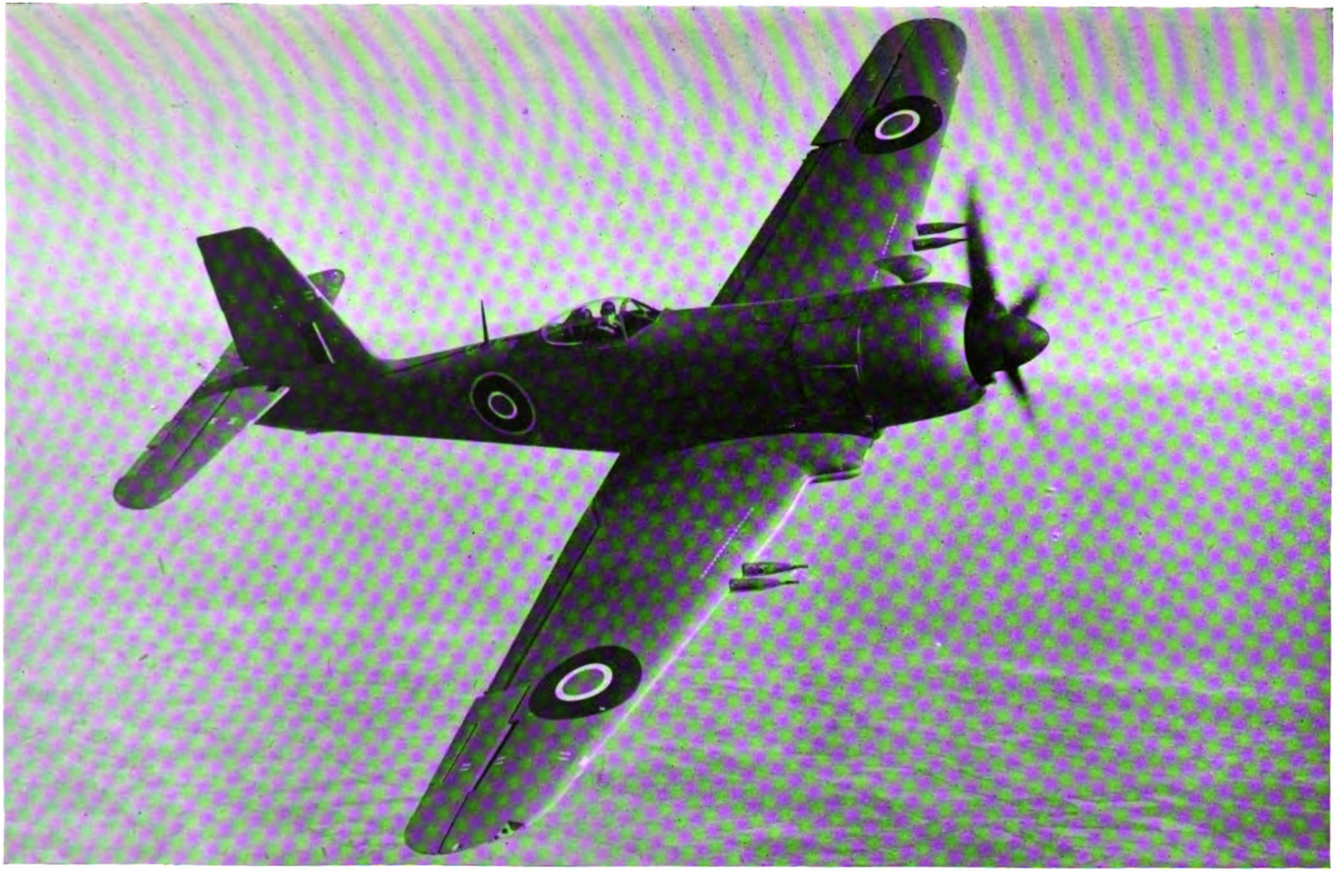
By the time the Smuts Committee had been appointed, the London area during the three years of war, had been subjected to nine raids, six by Zeppelins, and three by aeroplanes. In all these raids, 757 persons were killed, and 1,868 injured, a large proportion of the latter only slightly, while the material damage was estimated at £1,138,310—a contrast with the 343,000 casualties in the four and a half months of fighting on the Somme.

The task assigned to General Smuts, a lawyer by profession, and a politician by practice, involved the survey of an enormous field of highly-specialised and conflicting subjects—searching into the deepest requirements of Naval and Military strategy and tactics, investigating the root causes of industrial production and supply troubles, interpreting for the first time in history the lessons in respect of air power which were gradually emerging in the various war zones—and from the sum of these inquiries producing a solution to a problem which had baffled our own politicians. This monumental task, which called for extensive collection of evidence and the most dispassionate analysis, was completed within four weeks. Moreover, the inquiry was conducted at a time when and at a place where passions and emotions were running high because of the enemy's ability to employ in a new way a new weapon, whose potential was as yet uncalculated and was apparently, according to the Smuts Committee, incalculable. The extent to which the Committee was influenced by preceding events in London is shown by a comment early in its report which, apart from being purely conjectual and speculative, begged the entire question that it was required to investigate. That comment ran; "The Air Service on the contrary can be used as an independent means of air operations. No one that witnessed the attack on London on 7th July, could have any doubt on that point. . . . As far as can at present be foreseen, there is absolutely no limit to the scale of its future war use." The attack which impressed the Committee to this somewhat extravagant forecast was carried out in daylight by 21 Gothas, which dropped 87 H.E. bombs, and a number of incendiaries, killing 57 people, injuring 193, and damaging or destroying 109 buildings.

Next is recorded perhaps a classic instance of counting chickens, not only before they are hatched, but even before the very eggs are laid. The Committee argued as perhaps the one cogent and conclusive reason for the creation of an independent Service and Ministry the hypothetical accumulation of a vast surplus of aircraft and engines. The report continued—"The urgency for the change (the creation of a separate Air Ministry) will appear from the following facts. Hitherto, aircraft production has been insufficient to supply the demands of both Army and Navy, and the chief concern of the Air Board has been to satisfy the necessary requirements of those services. But that phase is rapidly passing. The programme of aircraft production which the War Cabinet has sanctioned for the following twelve months, is far in excess of Army and Navy requirements. Next spring and summer, the position will be that the Army and Navy will have all the air service required in connection with their air operations, and over and above that, there will be great surplus available for independent operations."

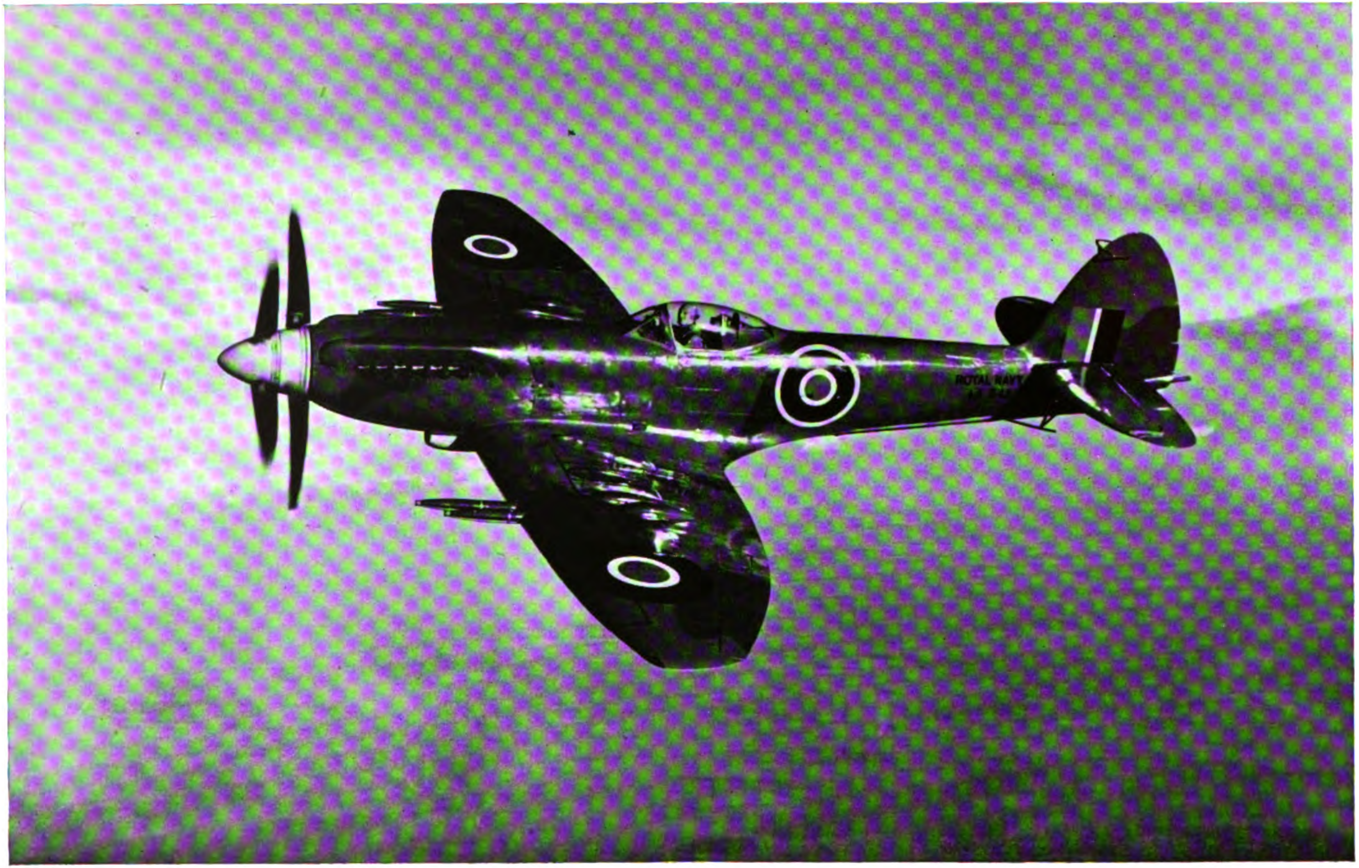
Never was so momentous a recommendation based on so frail a foundation. In the event: a stock of 400 new Scouts which had long been urgently required for active operations, with the Army was still, in January, 1918, awaiting the engines, which were to enable them to fly. Due to lack of a suitable engine, the replacement of the obsolete R.E.8 by the new Bristol Fighter in the reconnaissance and observation squadrons, which was due to take place in 1917, did not in fact commence till a few weeks before the German collapse at the end of 1918. Of the two wings of four-engine Super-Handley Pages, which were to carry the war deep into Germany, only three machines were ready by the end of the war in 1918. Moreover, within a few weeks of these optimistic estimates, aircraft for the Royal Flying Corps were being fitted with engines which were known to be defective because no other engines were available, and squadron commanders in the field had the unenviable task of committing their pilots to fight in aeroplanes in which, it was commonly known, engine failure was sooner or later inevitable.

The Smuts Committee had travelled a long way. It set out to find a means whereby the Air Board might be enabled to exert sufficient influence in respect of policy to co-ordinate the Naval and Military employment of air power, as well as controlling supplies of aviation material. It emerged with a recommendation for a separate Air Service under a separate Ministry as the solution. The Government acquiesced.



Firebrand Torpedo-Bomber.

(Courtesy of Messrs. Blackburn.)



Seafire, Mark 46, Fighter.

(*Courtesy of Messrs. Vickers-Armstrong.*)

The next step is interesting. The Government having sought to stifle and prevent disputes between the two Departments of State by the rather curious expedient of creating a third and even more vocal disputant, then proceeded to bring into being yet another arbitrary authority—" The War Priorities Committee "—composed of a chairman, General Smuts, and one member, Mr. Winston Churchill. This committee was to co-ordinate the demands for all munitions and war equipment and to possess absolute powers in deciding priorities and allocations. A body in fact, with those very powers which by themselves would have been sufficient to settle the differences between the Admiralty and War Office. The War Priorities Committee vanished with the coming of peace. The Air Ministry on the contrary, administering a separate service, was a permanent institution and embodied within its control all the air power which had contributed in large measure to the success of the armies in the field and had helped to maintain supremacy at sea.

The Navy and the Army, bereft of aircraft, were now dependent on a third service to provide what had become in fact, an integral part of sea and land forces. While the Air Ministry in turn had become, through no prescriptive right, inherent merit, or even any qualifications, a Department which possessed the right to criticise, and the power to embarrass, but was saddled with no direct responsibility for Naval or Military action.

THE EVOLUTION OF THE R.A.F. DOCTRINE OF WAR.

Under the calmer conditions of peace the new Service and Ministry had to provide more solid justification for their separate status. The process was as follows. With the formation of the Royal Air Force not only were those actually concerned with the recent air operations, and those genuinely interested in the true development of air power, transferred from the Navy and Army to the new service, but also those who, without the essential knowledge, saw in the growth of the new arm, openings and opportunities more profitable than in the older services. To these last perhaps, more than to the first, was the perpetuation of a separate service vital, and the distillation of a new gospel, to justify it, urgent.

The consequences of this extraction of the air-experienced and air-minded were two-edged. Not only were the Navy and the Army bereft of their specialist and experienced personnel, and thereby deprived of the very source of inspiration for research and analysis in the realms of aviation, but the very act of deprivation engendered the idea that the air was something separate and strange, and, being to those who remained in the Army and Navy an unknown quantity, was treated first with suspicion, then distrust, and finally hostility. Eventually neither Army nor Navy wanted to know what part the air had played in the past war, while the R.A.F. made it clear that its part in future wars was the concern of the R.A.F. alone. Thus, the hard-earned lessons of the last war were immediately relegated to oblivion, almost entirely in the Army, perhaps less absolutely in the Navy, which still had the problem of the carrier to occupy it.

An inversion of the same process went on within the Air Force. The very condition of separateness induced the conception of independence. Independence of everything that savoured of the past naval or military dependence, until very swiftly the Air Force evolved an independent gospel of war, and became not only unconcerned with analysing past operations for the purpose of deducing naval and military lessons, but dynamically disposed to ignore those lessons which were already patent.

In 1917, the function of the Royal Flying Corps was very clearly laid down in a memorandum issued in April of that year, namely :

> "The whole value of the R.F.C. lies . . . in the assistance it can give to the conduct of operations on the ground. Fighting in the air is not an end in itself, but under present conditions is a necessity to enable this assistance to be given."

This was confirmed by Foch's memorandum of 1918, already quoted. By 1925 the doctrine of air warfare had undergone a startling change. The R.A.F. gospel was now as follows.

> "If the Government had decided that the main effort towards winning the war was to be made by its air power, the object of the Air Force will be to dislocate the national life of the enemy people, and the vital centres would then be the seat of government, transport, and communication systems, and the water, light, and food supply. This doctrine as to the true objective of an Air Force is that laid down by the Air Staff, and quite apart from the validity of the arguments, must be accepted as the basis on which the Air Force is to be trained in peace, and led in war."

By 1926, the propounders of this strange decoction were themselves showing the first unmistakable signs of intoxication from their own brew. In a speech before a meeting of the Dominion Premiers, Sir Hugh Trenchard —than whom no man had been in a more advantageous position to observe the development of air power in support of the Army and who, as Commander of the Royal Flying Corps in France nine years before, had advised Sir Douglas Haig that the only sure counter to the German air attacks on London was the capture of the Belgian coastal area—on November 2, 1926, as Chief of the Air Staff made the somewhat obscure but quite astonishing statement :—

> "The air power that came into being in the Great War was mainly developed against air power. Was that the only way in which it could be used ? Does it mean that we must add extra forces and expenditure to the older forces, the Navy and the Army ? The question was constantly in the minds of those responsible, how could air power be developed against other fighting forces on the ground ? "

By the pronouncement of this new and strange gospel of war, the Air Staff created a truly remarkable situation, wherein the Air Force, which would assuredly again have to function as part of the other services, was to be trained, and therefore would fight, in accordance with a basic theory of war which differed fundamentally from that of the other two services : moreover one which was not supported by the lessons of the only war in which precedent might have been claimed.

The theory of waging war solely by bombing the vital centres of the enemy people, was an academic product of the Air Staff brain, and the whole edifice of the Royal Air Force doctrine of air warfare, was being built on a purely imaginary picture of the destructive power of bombing, and the estimated demoralising effect of such bombing on civilian populations. The new theory of war was in effect the technique of surprise attack, and indiscriminate bombing. Its progenitors, aware that in its naked crudity such a doctrine would be no less abhorrent to the average British mind than the parallel doctrine of indiscriminate sinkings at sea, took considerable pains to enunciate the theory cloaked in such high-sounding vague and ambiguous terms and phrases as "Air Blockade," "vital centres," "impressing public opinion to the point of disarming the Government," etc. The term "vital centres" particularly being sufficiently elastic and comprehensive to be used when expedient to cover naval, military, or any other sort of target, and so when necessary, permit of the real policy being disguised or even denied as expediency demanded.

The essential idea, however, stripped of all its wrappings and camouflage, emerges in its stark simplicity in Chapter XIV. of the War Manual for the Royal Air Force. This prescribes the methods used in making war against the less developed or semi-civilised peoples. Paragraph 21 states :—

> "The fighting forces of the enemy seldom present a suitable objective, and even if concentrated to oppose a land advance, the targets they offer to air attack are comparatively small and fleeting. Consequently air objectives will normally be limited to enemy habitations, his possessions, *and the personnel gathered in their vicinity*". (The italics are mine.)

The bomber doctrine is by itself neither self-sufficing nor inspiring. The duty of the bomber is to reach its target and bomb it. It should only fight if compelled to, in order to carry out its bombing duties. The progress of the bomber is therefore either one of evasion or of defensive fighting. In order to present a more inspiring picture, a supplementary doctrine characterised by more of the offensive spirit was necessary. Hence the unfolding of the creed of air superiority, which prescribes that the first duty of an air force is to acquire and maintain air superiority by means of its fighter aircraft, and that while air superiority is still in doubt, fighter aircraft should seldom be diverted from their normal function of securing it. A strange contrast to Foch's dictum : "The first duty of the fighting aeroplanes is to assist the troops on the ground. . . . Air fighting is not to be sought except as far as is necessary for the fulfilment of this duty." Thus by one quick turn, was, perhaps the foremost lesson of 1914–18, twisted out of truth, and what according to the leaders in the last war had been merely a means to an end, was now to become the end itself.

Such then, was the truth of the doctrine of "war by obliteration," a doctrine contrary to all ethics, economics, and the major military principle of conservation of energy. Above all, the evolution of this doctrine banished any central responsibility which might have insured the specialised development of air power to keep pace with the changing circumstances of sea and land power. The consequences of this last were to make themselves felt in later years when other countries, whose air and ground forces were integral, were forging ahead with the development of the technique of employing airborne formations and paratroops. Such development was impossible in this country because the Air Ministry was not only unconcerned with the production of transport aircraft, but actually antagonistic to such production, since it was held that every transport aeroplane was usurping the place of a bomber and so weakening the strength of the striking force. Exactly the same inhibition extended to gliders, and to air transportation as a supply line for troops. Whatever might have been a promising line of investigation from the Army side, received scant consideration on the air side.

In Russia, and in Germany, the employment of airborne troops was sufficiently far advanced by 1939 to be a normal routine of military operations. When the Germans had made a lightning capture of Crete in eight days by transporting 31,000 troops from Greece, and landing them literally on top of a numerically stronger defending force, the problem of transporting one battalion of infantry by air was still the subject of trial in Middle East. When, in December, 1941, we were unable to save the 1st New Zealand Division by supplying it from the air with 25-pounder artillery ammunition, the Americans were already laying the foundations of that network of air lines in the Pacific, which was soon to be, for their armies, the vital supply channel without which the tremendous operations in the islands of the South and South-West Pacific would not have been possible.

It was made abundantly clear, in Norway, in France, and in the Mediterranean, that an army, which has not been trained in peace to work in familiarity with aircraft, and has not been required in practice to solve the problems of countering airborne operations, will inevitably be taken by surprise, and be caught unprepared. The same applies to an air service. Unless it is constantly working with the Army it cannot know its own potentialities, or limitations, in military operations. The history of the years 1939–45 will reveal that the overhasty decision of 1917 has much to answer for.

L. MacLean.

CHAPTER X.

NAVAL PLANNING FOR AN AMPHIBIOUS OPERATION

THE PROBLEM.

THE object of an amphibious operation is the defeat of the enemy on land. It is a military object, and the efforts of all three Services must be directed to this end. The special naval task is to land the Army at the right time, in the right place, in the right order and provide conditions to ensure a flow of reinforcements—the " build-up "—at a rate exceeding that of the enemy on land. It is clear that these requirements cannot be met unless command of both the sea and the air has previously been gained in the area of operations and is maintained throughout. Maintenance of command of the sea must, therefore, be the Navy's first care throughout any amphibious operation, because on this depends the success of the whole enterprise. Subject to this consideration, however, everything else must be governed by the main military object.

The Army desires to be put ashore in its selected area. Since enemy defences are more heavily concentrated in the neighbourhood of ports, this landing, or assault, area must generally be an open stretch of coast, and ordinary harbour facilities are, therefore, denied to the invader. Until recently such assaults were made in ships' boats, but the development of means for defence and the necessity to supply overwhelming force at any point, have led to the creation of various types of landing ships, landing craft and amphibians.

LANDING SHIPS AND LANDING CRAFT.

Landing ships are those specially fitted to carry assaulting troops, vehicles and craft to the area of operations. Landing Ships Infantry (L.S.I.) for the most part are ordinary passenger liners adapted for this purpose by being fitted to carry assault craft, though the United States, possessing greater industrial capacity, have been able to build special ships. Other Landing Ships, however, have been specially evolved, such as the Landing Ship Tank (L.S.T.) which can run up on to a beach, lower a ramp in the bow and disgorge as many as 42 mixed vehicles. Another and useful type of vessel developed towards the end of the war is the Landing Ship Dock (L.S.D.) which can be used both for transporting larger landing craft to the assault area and for docking them if they are in need of repair. There are other types such as Headquarters (L.S.H.) and Emergency Repair Ships (L.S.E.).

Landing craft are of two main categories—major and minor. The former are those which can reach the assault area under their own power, such as Landing Craft Tank (L.C.T.) which can hold 6–9 tanks or 10 vehicles, Gun (L.C.G.) or Rocket Craft (L.C.T. (R)) to provide close support during the actual disembarkation, Landing Craft Infantry (L.C.I. (L)) which can carry 200–300 troops and run them in to a steeply shelving beach. Minor landing craft are those which must be carried in ships, and comprise Landing Craft Assault (L.C.A.), capable of carrying 35 men each, used to transport the assaulting troops ashore from the L.S.I.; Landing Craft Mechanised (L.C.M.), rectangular and clumsy-looking craft to carry mixed cargo or one vehicle; special craft for dealing with beach obstacles, and various other miscellaneous types. There are different "Marks" for each class of craft.

The latter period of the war saw a great development in the use of amphibians. Three-ton lorries, so constructed that they could proceed at 6 knots in the sea and 35–40 m.p.h. over the land, and known as DUKWS, were first used for the invasion of Sicily, where they proved invaluable in landing stores and ammunition, though manned by soldiers who had little knowledge of the Rule of the Road at sea. A tracked amphibian, known as an L.V.T. (Landing Vehicle Tracked), capable of lifting 30 troops and carrying a gun, rocket-firing or flame-throwing apparatus, was used in subsequent operations. In American Pacific operations these were sometimes used for an assault where coral reefs prevented the employment of L.C.A.; British experience, however, does not include such employment of these vehicles. "D.D.", or swimming tanks, were, however, used for the assault in the Normandy operation.

METHODS OF ASSAULT.

Unless the assault is on a very small scale and within easy reach of the base from which it is mounted, it will follow definite lines. The L.S.I. will bring the assaulting troops to what is known as the "lowering position," which may be six to eight miles to seaward of the point where they are to land. This position is selected so that the ships will not be seen if it is dark and will be outside the range of normal coastal artillery. Here they will anchor and rendezvous with any major landing craft which may be taking part in the operation. The L.C.A. will be lowered, troops embarked, craft will form up as arranged to meet the particular conditions of the assault and then proceed inshore, returning as necessary for subsequent flights. When the beach has been secured, the L.S.I. will move closer in and discharge remaining troops together with stores and equipment. In short-range operations, L.C.I. (L) may be used to bring "follow-up" troops, but the cramped living accommodation in these craft would not allow them to be employed, except for transferring troops from ship to shore, if they had to make a long voyage. Assaulting troops, however, are always landed either in L.C.A. or amphibians.

There may be numerous artificial obstructions to overcome on or off the beaches. In principle, the area to seaward of the position where craft ground is a naval responsibility, but each Service must be prepared to help the other in clearing these obstructions. Each naval assault force will normally include Landing Craft Obstruction Clearance Units (L.C.O.C.U.'s.) who are trained in the detection and demolition or removal of obstacles to the beaching of landing craft.

During, and for some time after, the initial landing, it is the Navy's duty to provide essential fire support. This is done from support craft—rocket or gun—working close inshore, and from H.M. ships further out, thus enabling the assaulting formations to be given a degree of artillery support comparable with that of their own artillery until such time as the latter can be landed and brought into action.

CHOICE OF LANDING PLACE.

The choice of beaches must obviously conform with the military decision where the main battle is to be fought, but military and naval requirements may conflict. The Army Commander will desire a beach which is sufficiently hard to allow wheeled traffic to pass over without getting " bogged," with suitable exits to allow such traffic to deploy, and space on the beach, or in close proximity to it, where temporary air strips can be laid. Features, natural and artificial, are also important from a military point of view, and the nearness of good roads or tracks is a big advantage. For the Navy, an ideal beach is one readily distinguishable from the sea, with an approach clear of navigational dangers and of a gradient sufficiently steep to permit landing craft to ground at the water's edge. The depth of water off shore is also important. If it is too deep then the L.S.I. will not be able to anchor in the " lowering position." Shore defences are, perhaps, the major consideration, but these affect both Services equally.

In practice it is seldom possible to find a beach that will fulfil all requirements, and steps have to be taken to overcome the difficulties once the joint staff has made its final decision. Navigational obstacles must be marked, and means devised for avoiding them ; if the gradient is flat, for instance, then the Navy must provide and operate some means for bridging the water gap between the position where the craft ground and the shore, or the Army must waterproof their vehicles so that they can be driven through a few feet of water. Naval lighterage pontoons, rectangular tanks 7 feet wide and 5 feet deep, can be carried to the assault area lashed to sides of L.S.T. and laid to form a floating pier. If the beach is too soft, then the Army can land and lay rolls of steel matting which will permit wheeled vehicles to pass over to harder ground.

PRELIMINARY RECONNAISSANCE.

When the different points for landing have been provisionally selected, it may well be discovered that insufficient details are known about them to enable the Navy to land the soldiers in the right place or to supply the Army with all the information they must require. If the landing takes place a few hundred yards from the arranged position, it might upset the entire military plan, as was demonstrated not only at Gallipoli in 1915 but also in minor amphibious operations carried out in the Mediterranean in 1942. So steps must be taken early to learn exactly what the beaches look like, to plot navigation marks, to chart outlying rocks and shoals, to determine the gradient with all the accuracy possible, to select suitable position for piers and pontoons and to obtain information about all forms of obstructions and enemy defences.

Much, but not all, can be obtained from aerial reconnaissance and photography, and from a scientific study of surf and wave formations. During the Normandy landings a well-known professor, disguised as an Instructor-Lieutenant R.N., guided craft through some submerged rocks which such study had convinced him existed in a certain position. He did this with great success although, as he afterwards confessed, at the critical moment he could not remember which was port and which starboard! Nevertheless, satisfactory results can only be obtained by surveys on the actual beaches to supplement the information from aerial reconnaissance. In the late war, pilotage parties were assembled and specially trained for this dangerous work. They were generally landed at night from submarines and they brought back invaluable data concerning invasion beaches in all theatres of war. Many, alas, never returned. On the information thus collected beach chartlets and sketches can then be prepared, the former showing the limits and names of beaches, defences, obstacles, mines, landing places, exits, navigational marks and other features.

NAVIGATION AIDS.

Having obtained all the data in connection with the beaches, it is next necessary to plan how to get the troops there. The first consideration is to get the assault convoy to the selected " lowering position " ; a usual method of doing this is by arranging for a submarine to lay a " sonic " buoy there, which for a given length of time gives out a sound signal which can be picked up on any suitable apparatus.

But the greatest navigational problem is that of the landing craft themselves during the passage—very often in the dark—between their parent ships and the shore. The navigational equipment carried in the average landing craft is most primitive and a cross wind or tidal stream could set them an unacceptable distance from the points planned for landing. So the initial assault flights are led in by a small landing craft which, instead of carrying troops, is fitted with the latest radar, direction-finding devices and infra-red equipment to enable it to " see " the beach in the dark. These craft are known as " navigational leaders." In designing them care is necessary that all this apparatus does not make the craft more conspicuous.

BEACH ORGANISATION.

The rapid clearance of empty craft from the beaches and of personnel, store and vehicles inland, are of vital importance in the early stages of a combined operation. These functions are carried out by a specially trained Beach Brigade which is subdivided into three Beach Groups. The strength of such a brigade is about 9,200, and certain specially formed units from the Royal Navy and the R.A.F. work in close co-operation with it. These units are known as Naval or R.A.F. Beach Commandos ; the former work under a Principal Beach Master (Commander R.N.), who has two assistants. Beach Groups are subdivided into smaller units, any one of which can be used for a minor landing operation where only a few troops are involved.

The naval responsibilities include the control of craft at the water's edge, the operational control of such craft between ship and shore, the marking of beaches, emergency repair or salvage and recovery of landing craft. The Army is responsible for the rapid discharge of grounded ships and craft, the clearance of the beaches and the movement forward, the preparation, marking and maintenance of beach exits, the removal or neutralisation of obstacles inshore of the point where craft ground. The R.A.F. ensure that their personnel, vehicles, equipment and stores are sorted, assembled and forwarded as quickly as possible by the Army organisation ashore.

CHOICE OF H HOUR.

The time at which the first craft ground is known as " H Hour " and all subsequent times are specified by reference to this moment. The selection is not easy. Naval supporting fire can be more effective with daylight spotting ; navigation and the unloading of supporting arms is easier by day, and also the control of large numbers of landing craft. On the other hand the chances of achieving tactical surprise are greater in the dark, and an attack at first light or before permits the maximum time to organise the assault anchorages before evening. The state of tide is also an important consideration. Beach obstructions are easier cleared at low water, but an assault at this time exposes troops to a greater volume of enemy fire. An assault on a rising tide facilitates the retraction of landing craft, and at high water the beach gradient is usually more suitable for disembarkation. In general, it has been found that a daylight attack is essential against a strongly fortified coast in order to develop the maximum effect from naval and air bombardment. Moonlight, although it may be of assistance to the other Services, from a naval point of view combines the disadvantages of dark and daylight with few compensating advantages of either. The entire plan and H hour may be influenced by beach obstructions and the method employed for dealing with them.

SECURITY.

Surprise—at least tactical—is usually the aim of every assault.* This can only be gained by denying to the enemy any hint about the preparations being made. It is best attained by imparting vital information to as few officers as possible, especially to those going on dangerous missions where there is a likelihood of them falling into the hands of the enemy. But secrecy can be overdone and, if subordinate commanders and their staffs are left in too much ignorance, their planning merely becomes academic. Various plans may be designed with the object of deceiving the enemy, to keep him guessing until the last possible moment, and, in a big operation, these may be elaborate. Steps may be taken to lead the enemy to suppose that the assault will take place in an area considerably removed from the one where it will, in fact, be launched. Artificial radio traffic, dummy landing barges and naval diversions may all be employed to lead the enemy on a false scent. Other precautions include the allocation of code numbers to ships which are never called by their real names, and by never allowing the date of D Day to appear in any written orders.

NORMAL NAVAL ORGANISATION.

A standard naval assault force, designed to lift one assault division, has now been adopted as the basis of the British naval organisation required for any amphibious operation. If the enterprise is on a large scale, then more than one assault force may be used : if it is only a minor assault, only a group or small division of such an assault force will be employed. This assault force is normally commanded by a Rear-Admiral —equivalent in rank to the Divisional Commander—and, if more than one assault force is employed, a naval C.-in-C. would be appointed to co-ordinate them. The Naval Force Commander exercises general naval command for the purpose of the operation and, within the " assault area," exercises full operational control. There may, however, be other naval forces covering the operation from a distance and these, of course, work under their own flag officers.

In an assault force there are three assault groups ; two of these each lift, as a rule, an assaulting brigade and the third may be kept in reserve or used for a Commando Group. The Commander of an assault group is usually a Captain R.N. (S.O.A.G.) who plans and works in close liaison with the Brigadier. The S.O.A.G. is responsible for the detailed training and organisation of his group, exercising operational control under the general direction of the Naval Force Commander. Groups are further de-centralised.

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* Tactical surprise may not always be necessary. If, for instance, the objective of an amphibious operation is the capture of an island where the points of landing are obvious, it may then be desirable to sacrifice tactical surprise in order to develop a heavy concentration of fire on these landing beaches before the actual assault is launched. This procedure was, in fact, sometimes adopted by the Americans in the Pacific War.

If the air support required for the operation is primarily naval, or if the R.A.F. effort is to be confined solely to long-range bombing, then the air commander in the assault area will be a naval officer. If, however, the operation involves substantial tactical R.A.F. participation before and during the assault, then it will be an R.A.F. officer.

PLANNING.

Apart from safe and timely arrival, the Army require to be put ashore in a special order, and this possibly means the arrangement of ships in convoy which is most inconvenient from a naval point of view. Then, once the assault troops have got ashore, naval responsibility is by no means ended. There is fire support; there is maintenance of the Army over the beaches or through a captured port; there is that vitally important commitment—the ensuring of a build-up more rapid than that of the enemy.

To achieve accurate co-ordination, exact planning and detailed preparation is necessary, and most of the problems that have to be considered affect more than one Service. It is, therefore, necessary for all planning and preparation to be on an inter-Service basis, joint staffs being brought together as soon as possible. Unilateral decisions by one Service, detrimental to the interests of one of the other Services, can only be avoided by close inter-Service co-operation. To make this more binding, the appointment of a Supreme Commander is essential, his very presence encouraging the three subordinate commanders to resolve their problems without having to refer to him for decision between them.

The scale of the operation naturally depends on the Army plan, and the Supreme Commander will issue a general directive while his planning staff produce an appreciation and outline plan, together with a detailed statement of the forces allocated. The next step—assuming that it is a large operation—is for all three Service Commanders to prepare a joint plan which is not detailed, but indicates the general manner in which they propose to carry out the operation. This should bring to light any omissions in the outline plan such as, for instance, inadequacy of forces. There always appears to be an insufficiency of shipping, for instance, and it is at this point that the various commanders have to decide to " make do " with what is available. The joint plan is then submitted to the Supreme Commander for approval. The Naval Force Commander will then brief his subordinate commanders, and planning will commence at all levels. Operation orders to include the movement of all naval forces under his command to the assault area will be prepared by the Naval Force Commander, his subordinates dealing with the conduct of operations under their immediate control.

As soon as planning starts in earnest the first conflicting service interest manifests itself in the time factor. On the naval side detailed orders have to be produced a long time before D Day. Ships cannot be prepared in a few hours, and the assembly of the vessels required involves world-wide movement and adjustment which must start months beforehand.

The Army, on the other hand, require to leave details of loading and landing as late as possible in order to conform with the latest information about enemy defences. Any changes, however, made in loading tables or order of landing involve serious implications for naval planning.

There are many matters which require early agreement between the Services, necessitating close integration in administrative and operational planning. Among many other things, there are inter-Service responsibility for Port Organisation, Defence of Ports and Anchorages, Communications, and duties in captured territory.

THE NAVAL PLAN.

After the intention and objectives have been clearly stated, the military formations taking part and the naval forces available are listed, together with the assault shipping and landing craft for the transport of the troops. The base ports and areas must then be designated, and the scale of enemy defence and hostile reaction estimated. Then, with the projected programme of sailings, intricate navigational problems connected with the approach have to be solved, and these include the general minesweeping effort required and the opening up of captured ports.

Early in the plan the air aspect has to be considered. How much co-operation is required between carrier-borne and land-based aircraft? What scale of fighter protection will be available for the protection of shipping and over the beaches, and how can such fighters best be directed? Finally, A.A. fire must be comprehensively controlled and safety lanes established for air transport.

Once the outline plan has been promulgated, the Naval Force Commander will issue a series of planning memoranda to assist the compilation of operation orders. These memoranda are apt to become voluminous, and will include such details as the composition of enemy forces, logistic data, salvage and medical organisation, the organisation for return convoys, general time-tables, bombardment plans, etc.

Each level will now prepare its own operation orders, those of the Force Commander designed to take the expedition to the dispersal point. From here each Assault Group Commander (S.O.A.G.) plans his own assault, delineates his beaches and prepares a time-table and organisation for the various flights. He must also make out orders for the clearance of beach obstacles in his sector and state the proportion of amphibians and landing craft he intends to use. Naval beach commandos, subsequently working with the Beach Brigade, are allocated to his group, and orders are made out concerning the recovery of damaged landing craft, evacuation of casualties and prisoners, disposal of survivors and, above all, lines of visual and wireless communication.

A large number of naval officers, men, and vehicles are required for shore duties in the assault area, and space must be found for them in the assault convoy. Such personnel include those required for naval beach commandos, landing craft recovery units, repair parties and the staffs of naval administrative officers who will operate from shore.

THE ORGANISATION AND LOADING OF CONVOYS.

Ships in the assault and immediate follow-up convoys are "tactically loaded." That is to say, military stores are so loaded that they will be disembarked in the order required for the advance, and this demands the greatest detailed planning and inter-Service collaboration. As soon as the cargo ships to be used have been nominated, complete measurements of the holds of them all must be obtained, and stowage plans for each hold made out, so as to embark the maximum number of vehicles desired by the Force Commander. The measurements of these vehicles are also required and, if ships are to be " tactically loaded," their stowage has to be related to their required order of disembarkation.

This pre-stowage plan is made out by " Q Movements " staff of the Army in consultation with the Navy and Air Force staffs and the Ministry of War Transport. The process of drawing it up is preceded by a joint conference in which all the authorities concerned are represented. Each of the Services presents to " Q Movements " its requirements for shipping space in each convoy—a process known as " bidding for space." For example, in the assault convoy the principal requirement is for the assault troops; but the Navy requires space for its beach parties, or at least so much of them as are absolutely indispensable for the initial stage, its L.C.O.C.U.' and the like. On receiving all these bids, " Q Movements " proceed to fit them into the ships to be used or, if space is not available to provide for them in full, informs the other authorities so that they may reduce their demands to what can be met.

The task of organising convoys is inclined to be irritating because, until a late date, it may not be possible to provide a firm allocation of ships. Even at the last moment, a vessel of different capacity may be put in to replace one which is found unavailable. In general, the L.S.I. and a few fast M.T. (cargo ships carrying Mechanised Transport), 12 knots or over, form the assault convoy, slower ones being used for the follow-up and subsequent build-up. It may be, however, that an insufficient number of fast M.T. ships are available, in which case a convoy of these ships has to be sailed before the troop convoy so that both will arrive at the " lowering position " at the same time.

ADMINISTRATION.

A naval assault force includes a number of relatively small naval units and parties, widely dispersed, afloat or ashore. All these are administered by the Naval Force Commander but, as soon as conditions allow, civil administration takes over responsibility for men not subject to naval discipline as, for example, men of the Merchant Navy and those under contract with the Ministry of War Transport.

If an assault force has no fixed base, and ships and men have been drawn from many different ports, considerable problems of supply and administration are introduced. It is necessary for such a force to have supply and repair ships of its own. Depending on the operation for which it is designed, such a force may need its own fuel and water tankers, store and accommodation ships. In the Pacific, for instance, there was an organisation known as the Fleet Train, comprising over 130 ships and 600–700 harbour craft, designed both to enable the fleet to operate at a distance from its normal bases and also to provide many of the requirements of a Force Commander in an amphibious operation.

MAINTENANCE OF CRAFT.

Each flotilla of minor landing craft has its own maintenance party under a qualified engineer officer and, in addition, mobile repair units are appointed for work on the beaches and in captured ports. Special arrangements have to be made for fuelling and watering craft in the assault area and such commodities may be carried and supplied from M.T. store ships and L.S.T. In short range—shore to shore—operations, trawlers may be specially fitted for supplying craft with fuel.

VICTUALLING.

All naval personnel operating ashore or in landing craft are supplied with a 48-hour emergency ration, and arrangements are made for naval beach commandos thereafter to live on Army rations supplied by the Beach Brigade Commander. A special organisation, however, is required for feeding landing craft crews who possess no victualling facilities, and certain ships in the anchorage may be detailed to look after them. Floating galleys in the shape of converted L. C. T.s have also been used, as well as barges fitted with some cooking arrangements and anchored in selected positions.

BUILD-UP PLANNING.

When the assault has been launched, the Naval Force Commander may leave the area of operations and turn over the responsibility for the build-up to an officer known as the Senior Officer Build-Up Group (S.O.B.G.). The organisation of the S.O.B.G. was created as a result of experience in Normandy and became an integral part of amphibious forces operating in the Far East. The S.O.B.G. remains afloat and his duties include the defence of anchorages in addition to those more directly connected with the build-up. His representative ashore is known as the N.O.B.U. (Naval Officer Build-Up) who works in close co-operation with the Army, meeting their demands and playing his full part in the inter-Service control organisation to carry out the plan. His duties are complicated. He must make a detailed organisation for all early follow-up convoys, estimate the casualty rate of craft, the handling capacity at their loading positions, the rate of discharge, weather and tidal effects; arrange facilities for the accommodation and feeding of the crews of minor landing craft and other naval personnel who need it; issue orders to oilers, colliers, water tankers, repair and maintenance parties.

What is known as the first key plan of the assault area is drawn up where positions are arranged for different dumps, headquarters, signal stations and other points of assembly. On this key plan the N.O.B.U. has to apply, or " bid," for positions where a camp may be erected for the naval beach commando, where fuel and spares for landing craft may be dumped; where damaged landing craft may be repaired; where naval transport may assemble and where communications centres may be set up.

Working under the N.O.B.U. is the Senior Officer Ferry Command (S.O.F.C.) whose duty it is to carry out the unloading plan by detailed allocation of craft and amphibians. He will also exercise a centralised control of the " turn-round " of ships and craft which involves their passage through recognised searched channels; their berths; supply of fuel, ammunition, water and provisions; the landing and disposal of casualties; replacement of crew casualties, and other details.

In order to effect good liaison with Masters of Red Ensign ships and represent their wishes, officers appointed by the Ministry of War Transport and known as Sea Transport Officers (S.T.Os.) are attached to the naval beach organisation. A control ship is also stationed to seaward to direct approaching convoys to appropriate sectors.

PORT ORGANISATION.

The Naval Officer-in-Charge, or N.O.I.C., is now the title given to the senior naval officer appointed in command of all naval activities in a captured port. With his opposite numbers in the Army (the Base Sub-Area Commander) and in the R.A.F. he plans the occupation and defence, acting as Chairman of the Port Executive Committee and as a member of the Defence Committee of which the military representative is Chairman. Everything has to be planned on an inter-Service basis, and this again calls for the closest co-operation.

COMMUNICATIONS.

One of the most important, and perhaps the most complicated, problem is that concerning efficient and rapid communication. Without it the whole operation loses cohesion. The whole question is dealt with by an inter-Service board of signal officers, and a complex system is devised to include communication channels for each task force, to control gunnery support, to pass information of enemy air and sea forces obtained by radar, situation reports and many other details. A beach signal station must be established at the earliest possible moment with adequate channels to all commands and authorities. Then, with the build-up, an organisation to control shipping must be brought into force, and there must always be an efficient recognition system. In addition to all this, good wireless facilities must nowadays be available for Press Correspondents.

TRAINING.

The complicated and unusual nature of the task set for a naval assault force demands an attention to detail which can only be achieved by comprehensive training and rehearsals. These should bring to light any defects in the organisation and, the longer the training period allowed, the better chance will the expedition have of success. Some phases of the operation, which at first sight might be thought impossible, become wholly possible if the men involved can be given the necessary training.

For the first big amphibious operation in the late war—the landing in North Africa—many imperfections were apparent because the training of landing craft crews was below that which the commanders would have wished. But, on this occasion, the disadvantage had to be accepted because the whole operation was a race against time. For the invasion of Sicily, however, and still more for the landing in Normandy, months of special amphibious training both for the crews of craft and for the assault forces was one of the essentials which made each of these operations a success. Above all, such training instills in each man, whatever his Service, a spirit of unselfish co-operation without which such success is impossible.

G. Stitt.

CHAPTER XI.

NAVAL LOSSES IN THE WAR.

When he introduced the Navy Estimates on March 7, 1946, the First Lord of the Admiralty, Mr. A. V. Alexander, gave to the House of Commons some information about the losses of the Royal Navy in the war. He showed that while the total casualties of all our Forces in the recent conflict were mercifully less than those in the first world war, the toll exacted from the Royal Navy, for whom this war was fiercer and far more widespread than any in its history, was even heavier. Nearly 51,000 officers and men of the Royal Navy, excluding the Navies of the Dominions, and excluding the Royal Marines, were killed or are missing. This number exceeds by over 20,000 the total killed in the Navy during the war of 1914–18. Losses of H.M. ships and craft, including requisitioned ships in naval service, from the beginning of the war to August 31, 1945, amounted to no less than 3,282. "This again," added the First Lord, "is an example and a warning, if warning is needed, of the terrible cost of modern warfare."

A comparison with the figures of the previous war indicates how much higher was the material cost of the recent conflict. Between August 4, 1914, and November 11, 1918, the Royal Navy lost 254 warships and 815 auxiliary vessels, a total of 1,069.[*] This was less than one-third of the number lost between 1939 and 1945. During each of the 51 months of the war of 1914–18 there was an average loss of 21 war vessels a month. During each of the 71 months of the war of 1939–45, the average rose to 46 war vessels a month, or more than double.

This higher rate of loss extended to all classes of ships; there was no exception. If a comparison is made with the numbers of each class in service at the beginning of the two wars, it will be found that we lost proportionately in 1939–45 half as many battleships and battle-cruisers again as in 1914–18, nearly three times as many cruisers, over three times as many destroyers, and more than twice as many submarines. (A similar comparison for aircraft carriers is not possible, as no ships of this type were in service until after war broke out in 1914.) The increased proportion of loss in 1939–45 is shown in the following comparative table:—

	1914–18.			1939–45.		
	Total in 1914.[†]	Total Lost.	Percentage of 1914 total.	Total in 1939.[‡]	Total Lost.	Percentage of 1939 total.
Battleships and Battle Cruisers	68	16	23%	15	5	33%
Cruisers and Light Cruisers	110	25	22%	50	31	62%
Aircraft Carriers	—	3	—	7	5	71%
Destroyers	218	64	29%	163	148	90%
Submarines	76	54	71%	51	77	150%

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[*] Admiralty Return to House of Commons, No. 200, 1919.

[†] Brassey, 1914.

[‡] Brassey, 1939.

An examination in detail of the causes and circumstances of the loss of such a large number of ships would involve a review of the whole history of the war, since nearly every operation, large or small, claimed its toll of casualties. While such a comprehensive task is beyond the scope of a chapter in "Brassey," a brief survey of salient features presents many points of interest.

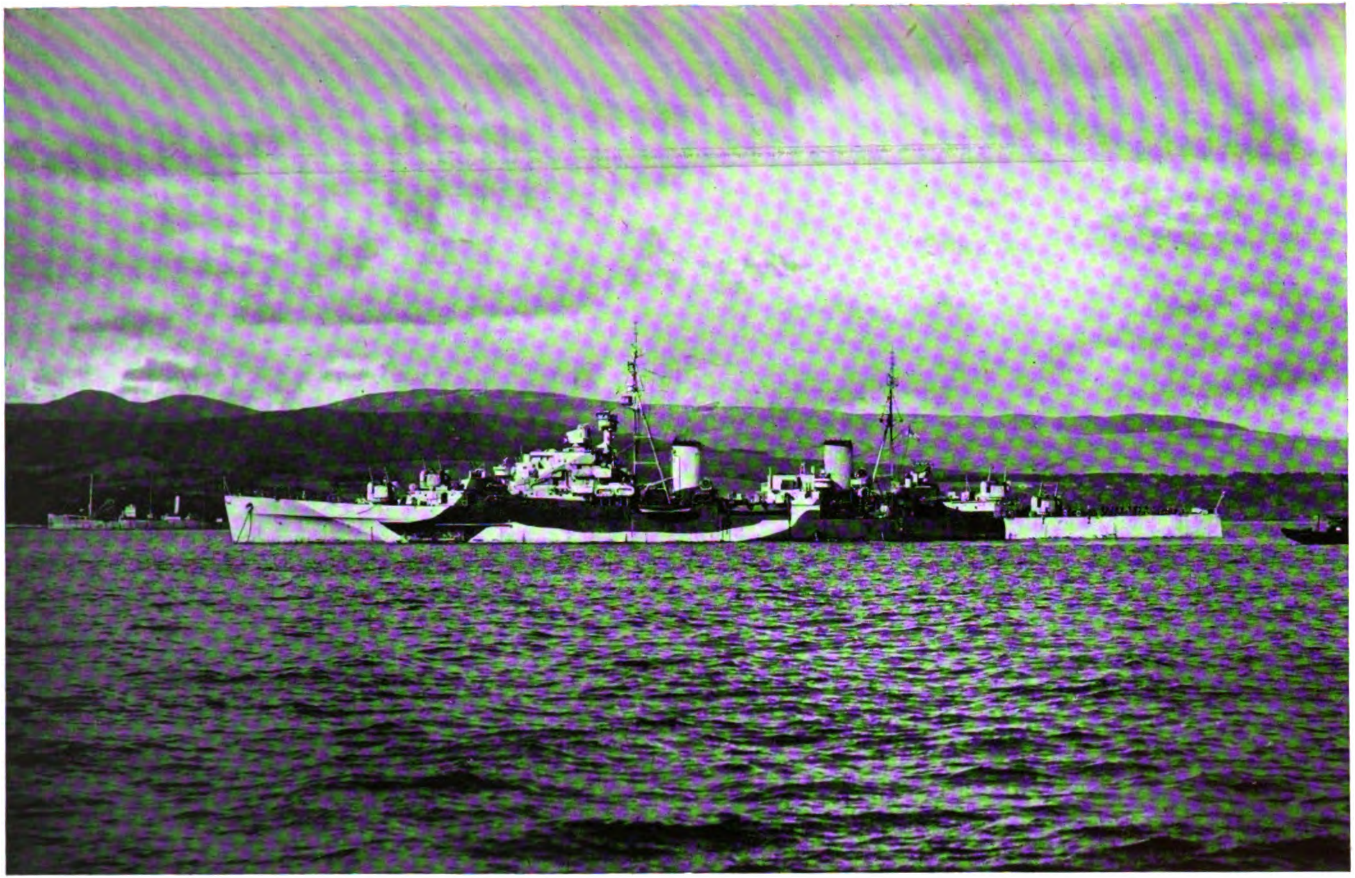
HEAVIEST LOSS FROM AIR ATTACK.

Enemy aircraft encompassed the destruction of more ships than any other agency. Excluding auxiliary vessels, the total was 106 out of 389, or well over one-fourth. U-boats, however, ran them very close, accounting for 100. In the various classes, casualties were fairly evenly divided between the two forms of attack. Aircraft, for instance, sank 11 cruisers and U-boats sank nine. Aircraft accounted for more destroyers (50) than did the U-boats (36); on the other hand, many more frigates and corvettes (29) were sunk by U-boats than by aircraft (5). This was due to the different employment of the frigates and corvettes, so many of which were engaged on the convoy routes, particularly in the Atlantic, where they were more exposed to under-water attack. As might be expected, more British submarines (9) were lost from air than from U-boat attack (5), but the former figure was surprisingly small in the light of the enemy effort. To enemy aircraft also belong the sordid and inglorious distinction of sinking seven out of the nine hospital ships lost.

It was not until after five months of war that the first ship was sunk as the result of air bombing, when the fleet minesweeper Sphinx was attacked on February 3, 1940, and foundered next day. Aircraft obtained their greatest success, of course, on December 10, 1941, when the Prince of Wales and Repulse were sunk by the Japanese off Malaya while operating without any air cover at all.

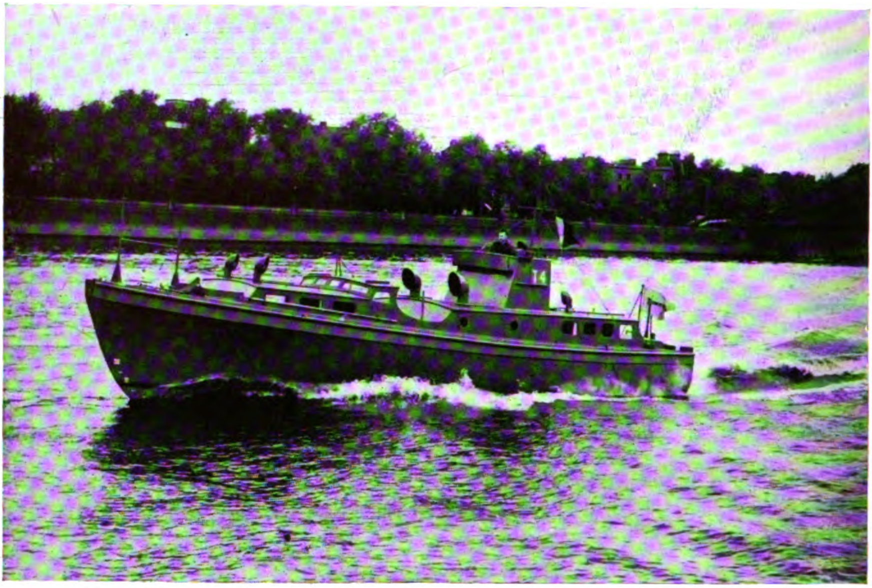
LIMITED SUCCESS OF U-BOATS.

The total of 100 war vessels sunk by U-boats in the six years of war must be accounted small in relation to the vast effort of the enemy in this type. It has been shown in a recent White Paper (Cmd. 6751) that nearly 1,000 U-boats were destroyed in the war, 781 German, 85 Italian, and 130 Japanese. This is in the proportion of ten U-boats lost for every British war vessel sunk by them. The spectacular success of the early weeks of war, when the Courageous and Royal Oak were sunk within a month, was fortunately not repeated. Only one other battleship was lost by U-boat attack throughout the war, the Barham, in the Eastern Mediterranean, on November 25, 1941; and two other aircraft carriers, the Ark Royal on November 13, 1941, and the Eagle on August 11, 1942, both in the Western Mediterranean. Incidentally, the Eagle was the last British aircraft carrier lost from any cause. None was sunk in the three years of war from August, 1942 to August, 1945, although the type was employed on an ever-increasing scale in many theatres, from Norway to Japan. Similarly, the degree of success of U-boats against cruisers dwindled as the war progressed. None was sunk in 1943, and only one, the Penelope, off Anzio, in 1944. The failure of the U-boats to inflict any serious loss upon the fleets covering and supporting the great landings in North Africa, Sicily, and Normandy is notorious.

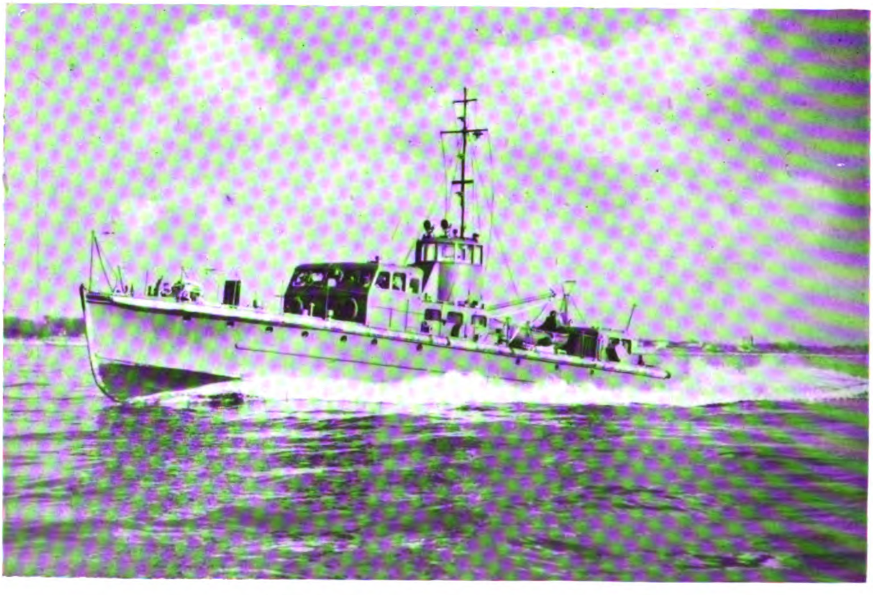


H.M.S. Spartan, Cruiser.

(Courtesy of Messrs. Vickers-Armstrong.)

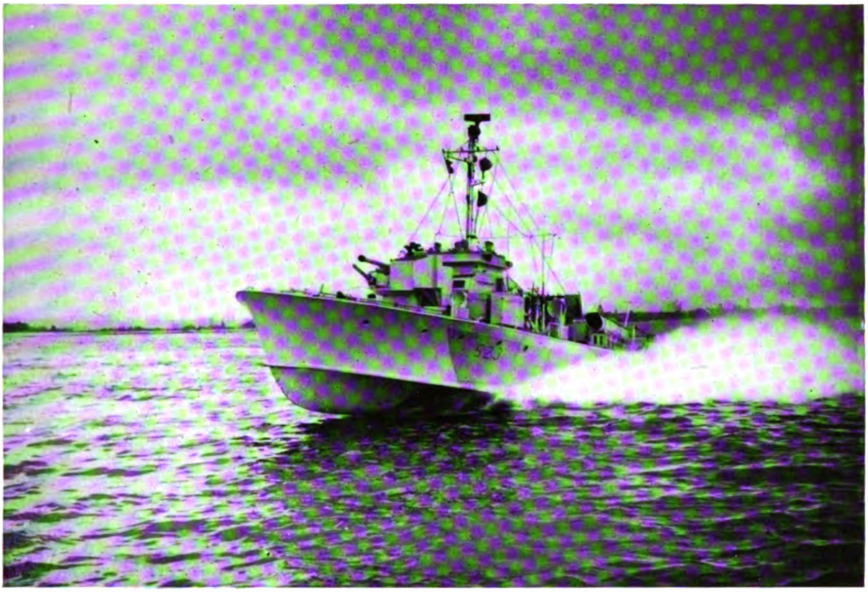


Thornycroft 45-foot Picket Boat.

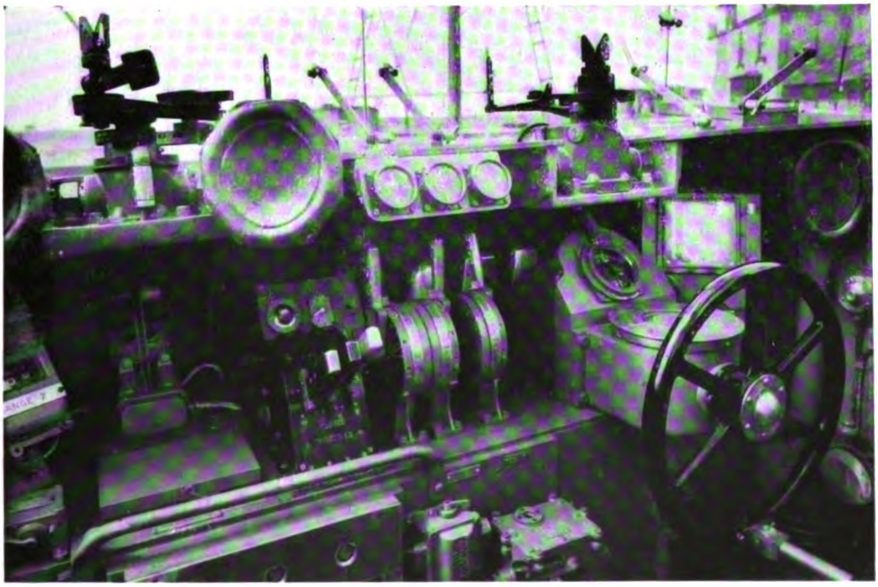


69-foot Target-Towing Launch.

(*Courtesy of Messrs. Thornycroft.*)

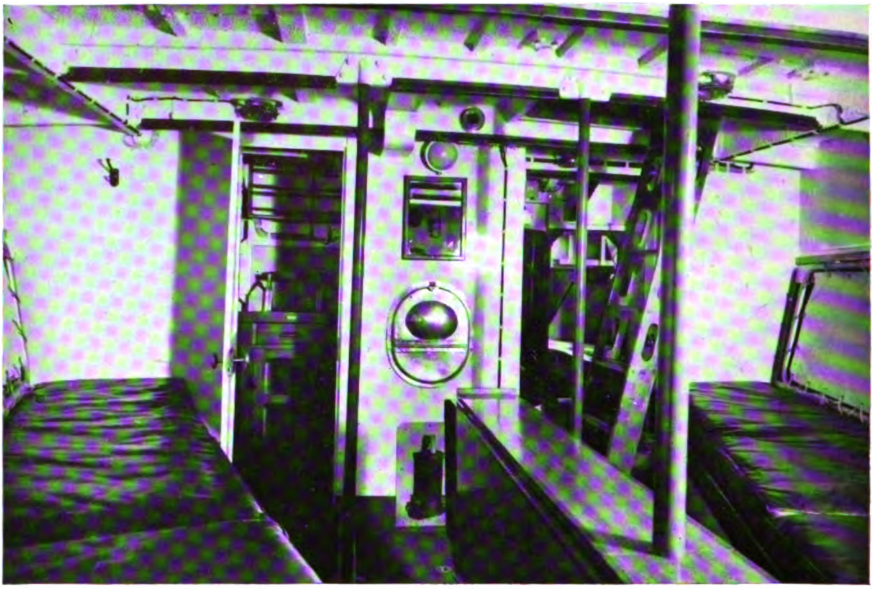


73-foot M.T.B. at speed.

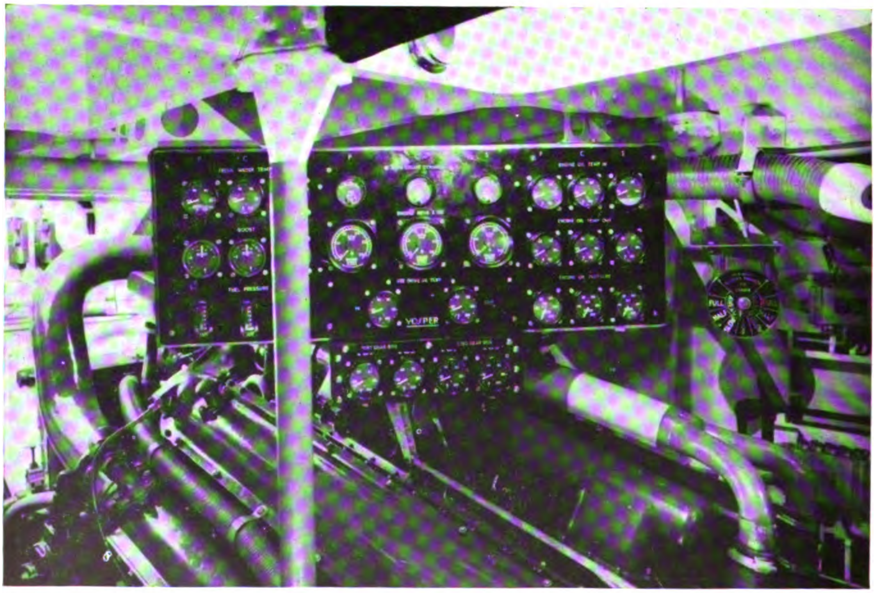


Navigating Bridge of 73-foot M.T.B.

(Courtesy of Messrs. Vosper.)



73-foot M.T.B.: Accommodation in Forecastle.



73-foot M.T.B.: Instrument Board in Engine Room.

(Courtesy of Messrs. Vosper.)

LOSSES FROM MINES.

Enemy mines were the third principal cause of loss, accounting for 74 ships. Only one cruiser was in this list, the Neptune, which was sunk in the Eastern Mediterranean on November 19, 1941. Mines, however, caused the most casualties among our submarines, destroying 27, or over a third of the total lost from all causes, and nine more than the number sunk by surface craft. The comparative immunity of the Fleet from mines of all kinds—no capital ship, sloop, or frigate was lost thereby—is a testimony to the gallant and unremitting work of the minesweepers, of which 38 were sunk during the war (apart from 225 auxiliary minesweepers) ; 13 of the 38, or one-third, were destroyed by the mines against which they laboured.

While the proportion of ships sunk by mines was slightly higher in this war than the last (19 per cent against 17 per cent), it included fewer vessels in the principal categories. In 1914–18, for example, five battleships were sunk by mines, two in home waters, two at the Dardanelles, and one off Malta.

SURFACE ACTION LOSSES.

Only 41 vessels, or just over 10 per cent of the total lost during the war, were sunk in action with surface craft other than E-boats and merchant raiders. Eighteen of the 41, or nearly one-half, were submarines. The principal losses in this category were the battle-cruiser Hood, sunk in action with the Bismarck on May 24, 1941 ; and the aircraft carrier Glorious, sunk by the Scharnhorst and Gneisenau on June 8, 1940, while returning home after the withdrawal from Norway. Three cruisers were lost in action with surface craft, all in Eastern waters, the Perth and Exeter off Java, and the Canberra in the Solomon Islands, all in 1942. Two armed merchant cruisers were similarly lost to surface warships, the Rawalpindi being sunk by the Scharnhorst in November, 1939, and the Jervis Bay by the Admiral Scheer a year later, both in the North Atlantic.

In addition, armed merchant raiders destroyed two ships, the cruiser Sydney off Western Australia on November 19, 1941, and the armed merchant cruiser Voltaire in the South Atlantic on April 4, 1941.

E-boats, of which the enemy employed large numbers, both in home waters and the Mediterranean, were chiefly engaged with our own Coastal Forces, but two cruisers and eight destroyers were among their victims. The cruisers were the Manchester, on August 13, 1942, in the Western Mediterranean, and the Charybdis, on October 23, 1943, in the western part of the English Channel. All but one of the eight destroyers lost by E-boat attacks were sunk in home waters.

The loss of 16 warships by collision compares with a total of 25 in the war of 1914–18. The principal ship lost in this way was the anti-aircraft cruiser Curacoa, which was rammed and sunk by the s.s. Queen Mary on October 2, 1942, off the Donegal coast. A U-boat alarm caused the liner, with over 15,000 American troops on board, to take avoiding action to starboard at the same moment as the Curacoa was racing past her towards the reported position of the submarine.

AREAS OF LOSS.

The area which had the highest total of losses was not, as many might have expected, the waters around the United Kingdom, but the Mediterranean. Of the total of 389 war vessels lost, no less than 160, or over two-fifths, were sunk there. Included in this figure were 16 cruisers and anti-aircraft cruisers (one-half of the total lost in all areas), 61 destroyers and 46 submarines (three-fifths of the total lost in all areas). In this heavy toll is reflected the grim struggle of the Fleet to hold on to the Mediterranean and to keep Malta going at a time when no reinforcements could be spared from home waters or elsewhere, and when, besides the full strength of the Italian Navy, it was faced with attacks by German U-boats and German air forces in Sicily and the Dodecanese. As the First Lord reminded the House of Commons on March 7, Admiral of the Fleet Lord Cunningham, for a period, had "to contain a major fleet of battleships, and numerous cruisers and destroyers, with no more than a few cruisers, destroyers and submarines," and, it may be added, with all too scanty air protection.

Casualties around the United Kingdom numbered 106, or well over a quarter of the whole. They included 50 destroyers (one-third of the total in all areas), 21 submarines, 13 fleet minesweepers, seven corvettes and five frigates. Such was the price in material—not too heavy in all the circumstances—which the Royal Navy had to pay for the successful defence of the homeland, the main base of the Allied war effort.

Third in the scale of loss according to areas was the North Atlantic, with 70 casualties, distributed over nearly all types of vessel. Here were lost 19 destroyers, 17 corvettes, six submarines, four sloops, four frigates, four fleet minesweepers and three cruisers. Casualties among armed merchant cruisers were most heavy in the North Atlantic, ten ships out of the total of 15 being sunk there.

The fourth area of heaviest loss was the Arctic Ocean, in which so many actions occurred in keeping open the convoy route to North Russia. The 21 losses there were made up of two cruisers, eight destroyers, three corvettes, three fleet minesweepers, two sloops, two frigates and one submarine. In comparison with other theatres of war, the losses in the Indian Ocean and the Pacific (16 each) were numerically small, but they included a higher proportion of big ships, the battleship Prince of Wales, battle-cruiser Repulse, aircraft carrier Hermes, and six cruisers being among them.

FEW LOSSES IN 1939.

The rate of loss naturally fluctuated at various periods of the war. It would take too long to follow the casualty ratio all through the six years of conflict, but mention may be made of certain phases. Very slight loss was caused by the initial impact of hostilities. Only seven vessels, apart from auxiliaries, were sunk up to December 31, 1939, or in four months of war. This was less than half the number sunk in the corresponding period of the war of 1914–18, as the following comparison shows :—

British Warships Lost in First Four Months of War.

	Aug. 4 – Nov. 30, 1914.		Sept. 3 – Dec. 31, 1939.	
Type.	Number.	Tonnage.	Number.	Tonnage.
Battleships . . .	2	38,000	1	29,150
Aircraft Carriers . .	1	5,600	1	22,500
Cruisers . . .	9	75,765	—	—
Destroyers . . .	—	—	3	4,070
Submarines . .	4	2,802	1	1,354
Armed merchant cruisers	1	17,274 g.t.	1	16,697 g.t.
Totals . . .	17	139,441	7	73,771

The comparatively small loss in 1939 was the more satisfactory in view of the increased risks in naval operations. The most significant feature was the complete absence of loss from enemy air attack, which falsified many pre-war predictions. Not until February 3, 1940, as already mentioned, did the first loss from air attack occur to the fleet minesweeper Sphinx. True, the Germans had not in 1939 begun to use air power on the scale which later on, in the absence of adequate air protection, was to prove deadly to several ships. They had, however, made attacks on the Fleet and had scored hits. Then, too, the U-boats in 1939 were so disposed, even before hostilities began, as to be able to attack earlier and more effectively than in 1914. The destruction of the Courageous and Royal Oak on September 17 and October 14 respectively was a great score for them, but it represented the high-water mark of their success.

From mid-November also there was the added risk of the magnetic mine, which was promptly countered with the aid of our scientists. The lack of success from this, the first of the enemy's so-called secret weapons, must have caused him keen disappointment. No ship larger than a destroyer was sunk by it. About a dozen minesweeping trawlers and drifters were, however, lost from mines up to the end of 1939.

LOSSES OFF NORWAY, 1940.

The campaign in Norway between April and June, 1940, brought the first loss of a British cruiser, though not by enemy action. On May 17, the Effingham struck an uncharted rock in the Narvik area, and efforts to salve her were unsuccessful. At the corresponding period of the war of 1914–18, we had lost nine cruisers. An outstanding feature of the Norwegian campaign was the menace of air attack to ships obliged to operate without effective air cover within range of enemy shore-based aircraft, but the majority of the casualties were caused by other means. The destroyer Glowworm was sunk in action with a surface force on the day before the German landing. Two more destroyers, the Hardy and Hunter, were lost in surface actions at Narvik. Only one British destroyer, the Afridi, was a victim of air attack, on May 3, after the withdrawal from Namsos.

The brunt of the enemy air assaults fell on the small ships, especially the sloops, stationed off the landing points to provide anti-aircraft protection. These vessels, as Admiral Sir Bruce Fraser, then Third Sea Lord and Controller, said in a speech, went through " the devil of a time," and used up all their ammunition. Their attitude of gay defiance was illustrated by a laconic signal from the Auckland on April 20, which ran, " Bombed again, have shot him down." It is remarkable that only one sloop, the Bittern, was sunk, off Namsos on April 30. On May 25 there occurred the sinking of the first anti-aircraft cruiser lost in the war, the Curlew, from bombing in the Narvik area. The submarines, in the course of their hazardous patrols off Norway, lost three of their number within a month, the Thistle, Sterlet and Seal.

The heaviest loss in connection with the Norwegian campaign occurred after the final withdrawal from Narvik in June, when the aircraft carrier Glorious, bringing back R.A.F. fighters, and the destroyers Acasta and Ardent were overwhelmed by the Scharnhorst and Gneisenau. The loss of the Glorious, following that of the Courageous, was unfortunate, but six new carriers were under construction. German losses in Norway were much more serious. They lost three of their eight cruisers—the Blücher, sunk by shore batteries in Oslo Fiord; the Karlsruhe, sunk by the submarine Truant off Kristiansand; and the Konigsberg, sunk by the Fleet Air Arm at Bergen (the first warship in any navy to be destroyed by dive-bombing). They also lost ten destroyers and one torpedo-boat in the operations at Narvik.

LOSSES OFF HOLLAND AND BELGIUM.

In the peculiar conditions under which the Royal Navy was called upon to operate close inshore in support of the armies during the German invasion of the Low Countries, which began on May 10, 1940, it might have been expected that casualties would be heavy; but they were not. Although several ships were damaged by air attack, only three destroyers were sunk thereby; the Valentine, off Zeebrugge, the Whitley, off Nieuport, and the Wessex, off Calais. The first British minelayer lost in the war was sunk after operations on the Dutch coast. The Princess Victoria had laid a minefield north of Ymuiden to provide cover to our naval forces and to shipping engaged on evacuation. On May 18, returning from further minelaying in the East Coast barrier, she was sunk by a mine off the Humber.

The first hospital ships to be sunk were victims of air attack off Dieppe, the Maid of Kent on May 21 and the Brighton on May 24. A third, the Paris, was similarly destroyed off Dunkirk on June 2, during the withdrawal.

THE DUNKIRK WITHDRAWAL.

The withdrawal from Dunkirk, between May 27 and June 4, was an affair of little ships, which inevitably paid a high toll. Out of approximately 800 vessels of all kinds, British and Allied, which were engaged, about 25 per cent. were sunk. The principal British warships employed were 41 destroyers, of which six were sunk, the Grafton, Grenade, Wakeful, Basilisk, Havant and Keith. There were also 36 minesweepers, of which five were sunk; and 47 trawlers, of which 11 were sunk. The majority were victims of air attack. French warships taking part in the evacuation numbered 23, chiefly destroyers, of which type three were lost, the Foudroyant, by air attack, and the Bourrasque and Sirocco, by torpedoes.

The twelve months following June, 1940, when France collapsed, Italy entered the war, and Great Britain stood alone against the Axis Powers, inevitably caused a rise in the casualty rate, owing to the addition to the areas of conflict and the scarcity of forces for the hazardous tasks undertaken. The principal loss during this period was that of the battle-cruiser Hood, sunk on May 24, 1941, in action with the Bismarck during her sortie into the Atlantic from which she never returned—a much greater loss for the enemy.

The first loss in the Mediterranean was that of the cruiser Calypso, on June 12, 1940, by U-boat attack. Happily, it proved an isolated case, as apart from some destroyers and submarines, no further loss was sustained there until after the German Air Force had arrived on the Sicilian airfields early in 1941.

U-boats continued to claim victims in the Battle of the Atlantic, particularly among the armed merchant cruisers which had of necessity to be employed on patrol until more suitable escort vessels could be provided. This battle was waged throughout the war, and a survey of the losses it involved would need a chapter to itself.

In the Narrow Seas, aircraft and mines caused several casualties. Four destroyers, for example, the Brazen, Codrington, Wren, and Delight, were lost in the Southern North Sea or English Channel within 11 days in July, 1940. There was also a heavy toll of submarines in areas as far apart as Norway and Libya. Yet, viewed in relation to the heavy odds, and its many commitments, the Navy did well not to lose more ships in this year of isolation.

LOSSES OFF GREECE AND CRETE.

The withdrawal of the Army from Greece in the last week of April, 1941, for example, was conducted at small cost. The destroyers Diamond and Wryneck, sunk by aircraft on April 27, were the only warships lost, although four transports were sunk. Incidentally, it may be recalled that the Army was moved into Greece early in March without the loss of a ship, man or gun, except for a few bomb casualties in one merchant vessel.

It was a different story in the operations connected with the German capture of Crete. Between May 20 and June 1, 1941, the Fleet lost the cruisers Gloucester and Fiji, the anti-aircraft cruiser Calcutta, and the destroyers Juno, Greyhound, Kashmir, Kelly, Imperial, and Hereward—all from air attack. As in Norway a year before, air superiority lay with the enemy, and the Fleet alone, while it prevented a seaborne invasion until after the issue had been decided by the air assault, could not save the island ; but it got the Army away, and exacted a heavy toll from the Germans which delayed and dislocated their plans for further aggression.

THE WORST PERIOD OF THE WAR.

The worst period of the war as regards casualties to H.M. ships occurred in the months of November and December, 1941. It was referred to in a broadcast later by the First Lord, Mr. Alexander, as " the crisis in our fortunes." The run started with the sinking of the aircraft carrier Ark Royal in the Western Mediterranean on November 14 after a hit from a U-boat's torpedo on the previous day. On November 19, the Australian cruiser Sydney was lost in action with a disguised merchant raider in the Indian Ocean. On November 24, the cruiser Dunedin was torpedoed and sunk by a U-boat in the South Atlantic. Here were three good ships lost in widely separated areas without any corresponding loss to the enemy. But worse was to come.

On December 7, Japan began hostilities, without any declaration of war, and three days later the Prince of Wales and Repulse, which had been sent from home to the Far East in the forlorn hope of deterring the war party in Tokyo, were destroyed by Japanese naval aircraft off Malaya. On December 14, the cruiser Galatea was sunk by a U-boat near Alexandria; and on December 19 another Mediterranean cruiser, the Neptune, and a destroyer, the Kandahar, were sunk by mines near Tripoli. A still more serious blow befell the Fleet at Alexandria on December 19. About half a dozen Italians with human torpedoes were able to penetrate into the harbour and blow large holes in the bottoms of the battleships Queen Elizabeth and Valiant, disabling the Mediterranean Battle Squadron for several months. Fortunately, it was possible to conceal the seriousness of the position from the enemy during those vital months. The dismal record of that month was added to on December 21 when there occurred the first loss of an escort carrier, the Audacity, which was torpedoed by one of a U-boat pack while escorting a homeward-bound Gibraltar convoy.

On Christmas Day Hong Kong fell, the destroyer Thracian and some smaller vessels being lost there.

LOSSES OFF JAVA AND CEYLON.

Further losses were caused in the early months of 1942 by the advance of the Japanese. A large number of small vessels and harbour craft had to be sacrificed by the fall of Singapore on February 15. The naval operations connected with the enemy invasion of the Netherlands East Indies, including the Battle of the Java Sea on February 27, cost the Allies about 40 ships of war of all kinds. Five were cruisers, the British Exeter, Australian Perth, American Houston, and Dutch De Ruyter and Java. Sixteen were destroyers—four British, five American, and seven Dutch. The Australian sloop Yarra, American gunboat Asheville, and seven American and Dutch submarines were among the other ships lost, some of the submarines having to be scuttled to avoid capture in port.

Melancholy as was the destruction of so many ships, without any appreciable loss to the enemy, it was the price demanded for resistance to the vastly superior Japanese Navy in the flood tide of its success. Later in 1942, the enemy's advance was checked, never to be resumed, but before this happened his fleet made one solitary advance into the Indian Ocean, in April, which inflicted further loss. Two 8-in. cruisers, the Dorsetshire and Cornwall, one aircraft carrier, the Hermes, two destroyers, the Tenedos and Vampire, and the corvette Hollyhock were sunk by carrier-borne aircraft in operations off Ceylon, again with no corresponding loss to the enemy.

RUSSIAN CONVOY LOSSES.

Other Royal Navy losses in 1942 were incurred in the protection of convoys to and from North Russia. No warship, and only one merchant ship, had been sunk in these convoys in 1941, but in 1942 the Germans sought by every possible means to stop the flow of supplies carried in them.

Ten warships were lost, four by or after U-boat attack, two by surface craft, two by aircraft, one by mine and one in collision. Two cruisers headed the list. The Edinburgh, damaged by a U-boat torpedo on April 30, was sunk by a destroyer torpedo attack on May 2; and the Trinidad, damaged by a destroyer torpedo on March 29, and temporarily repaired in Russia, was sunk by aircraft during her return on May 14. Four destroyers were lost—the Matabele by U-boat attack on January 17, the Punjabi by collision on May 1, the Somali by U-boat attack on September 20, and the Achates in action with surface forces on December 31. The other four casualties were to fleet minesweepers—the Gossamer was sunk by aircraft on June 24, the Niger by a mine on July 5, the Leda by U-boat on September 20 in the same convoy as the Somali, and the Bramble in the surface action on December 31.

MALTA CONVOY LOSSES.

Convoys to Malta were another cause of loss in 1942. Major Fleet operations, in January, March, June, and August, were necessary for these convoys to be fought through, and in the course of them 13 warships were sunk, six by U-boats, five by aircraft, one by E-boat and one by mine. The principal ship lost was the aircraft carrier Eagle, sunk by U-boat on August 11. The cruiser Hermione and anti-aircraft cruiser Cairo were also sunk by U-boats, on June 16 and August 12; and the cruiser Manchester was destroyed by E-boat attack on August 13. Nine destroyers were lost, the Gurkha (second of her name to be sunk in the war), Heythrop and Hasty, by U-boat; the Bedouin, Airedale, Nestor (Australian), Foresight and Legion by aircraft; and the Southwold, by mine. Several other ships were seriously damaged. The risks incurred, especially in the passage of the Sicilian Narrows, were great. The air menace was particularly strong, as the enemy had bases nearer to the convoy route than those from which his aircraft attacked the Russian convoys. It was satisfactory that the loss during the year from air attack was kept down to five destroyers.

FEWER LOSSES AFTER 1942.

By November, 1942, the Allies had gone over to the general offensive both in Europe and the Pacific. In this later phase of the war, casualties to ships were much lighter. Attack proved less costly than defence. No British capital ship, aircraft carrier or escort carrier was lost by enemy action after 1942. No ship of war larger than a destroyer was sunk in the North Africa landing or the invasion of Sicily. Only one cruiser, the Charybdis, was sunk in 1943, by E-boat attack in the English Channel, as compared with ten in 1942 and nine in 1941; and while the number in 1944 went up to four (two off Anzio, the Spartan and Penelope, and two off Normandy, the Durban and Dragon), one of these, the Durban, was voluntarily sunk as part of the Mulberry harbour. United States losses in the Pacific from 1943 to 1945 included one aircraft carrier, the Princeton, five escort carriers, one seaplane tender, and three cruisers, a very small total in relation to the vast scale of the operations. The British Pacific Fleet which co-operated in the advance towards the Japanese mainland in 1945 lost no ships.

The comparative immunity of the Fleets in the Pacific was remarkable in view of the persistency and viciousness of enemy air attacks. Suicide bombers caused no British loss, but three American escort carriers were among their victims. There were some remarkable escapes. The Commonwealth cruiser Australia survived five hits by suicide aircraft, on January 2, 5, and 6, 1945, and yet remained able to fight, although at reduced speed and short of many of her officers and men owing to casualties.

DOMINION LOSSES.

The Navies of the Dominions shared with the United Kingdom in full measure the naval losses demanded by the war. Australia lost three of her five modern cruisers, the Sydney in action with a raider in November, 1941; the Perth in the fighting off Java in February, 1942, and the Canberra in action off the Solomon Islands six months later. It was to replace the Canberra that the Shropshire was presented to Australia by H.M. Government in the United Kingdom. Four Commonwealth destroyers were lost; the Waterhen and Nestor in the Eastern Mediterranean, the Vampire in the Indian Ocean, and the Voyager off Timor. Other losses included two sloops, the Parramatta and Yarra, and three minesweepers, the Armidale, Wallaroo and Geelong. This total of twelve ships represented a high proportion of the effective strength of the Royal Australian Navy at the time.

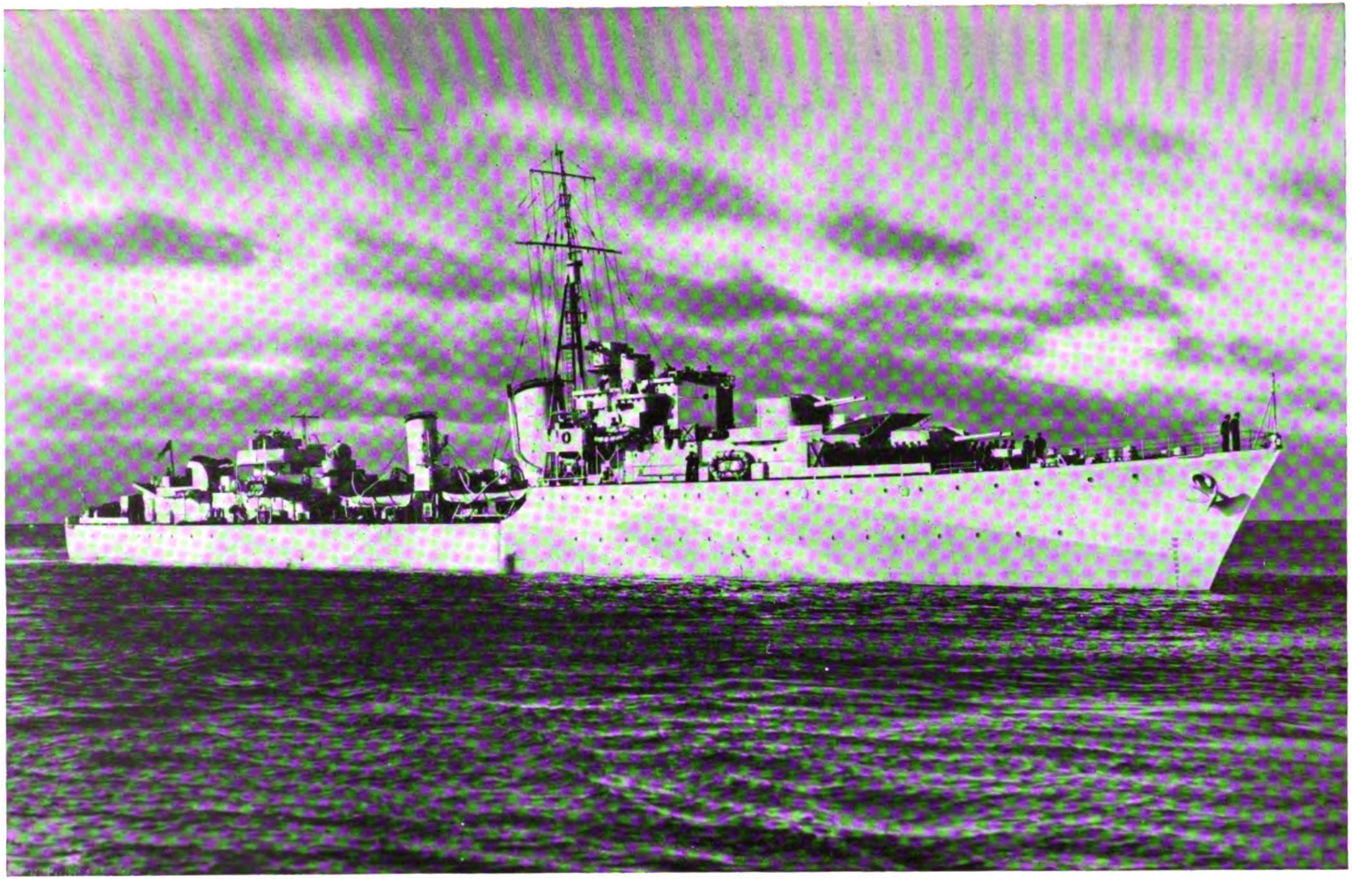
Casualties in the Royal Canadian Navy were numerically higher, as the Dominion operated many more small craft—destroyers, frigates, and corvettes—of which a number were built in her own shipyards. She lost seven destroyers, the Fraser, Margaree, Ottawa, Veteran, St. Croix, Athabascan, and Skeena; one frigate, the Valleyfield; ten corvettes, the Levis, Windflower, Spikenard, Charlottetown, Louisburg, Weyburn, Regina, Alberni, Shawinigan, and Trentonian; and four minesweepers, the Chedabucto, Clayoquot, Guysborough, and Esquimalt—a total of 22 ships in all.

The New Zealand Navy lost three small craft—the auxiliary minesweeper Puriri, by mine in the Hauraki Gulf, Auckland, on May 14, 1941; the auxiliary minesweeper South Seas, sunk in collision with a ferry in Wellington Harbour on December 19, 1942; and the minesweeping and anti-submarine vessel Moa, sunk by aircraft off Tulagi, Solomon Islands, on April 7, 1943.

The Royal Indian Navy lost the corvette Pathan off Bombay on June 23, 1940, and the sloop Indus off Burma on April 6, 1942. It also lost two auxiliary minesweepers, one in 1941 and one in 1942, and the anti-submarine auxiliary vessel Parvati, sunk by a mine in the Red Sea on April 30, 1941.

The South African Naval Service lost four small craft which had been placed at the disposal of the Royal Navy in the Mediterranean—the anti-submarine whaler Southern Floe, presumed mined off Tobruk on February 11, 1941; and three minesweeping whalers, the Parktown, sunk by E-boat off Bardia on June 21, 1942; the Bever, mined in the Piræus area on November 30, 1944, and the Treern, mined in the Aegean on January 12, 1945.

G. H. Hurford.



H.M.C.S. Athabaskan, Destroyer.

(Courtesy of Messrs. Vickers-Armstrong).

REFERENCE SECTION.

DIMENSIONS AND PARTICULARS OF BRITISH AND FOREIGN WARSHIPS.

Warships are arranged in classes, except in some instances where they are arranged alphabetically. The following abbreviations are used throughout the List:—

a.g.b.	Armoured gunboat.
g.b.	Gunboat.
b.	Battleship.
b.c.	Battle cruiser.
l.cr.	Light cruiser.
c.d.s.	Coast-defence ship.
A.M.Cr.	**Armed Merchant cruiser.**
M.Cr.	Minelaying cruiser.
cr.	Cruiser.
A.A. or H.A.	Anti-aircraft guns.
A.C.	Aircraft carrier.
L.A.C.	**Light Aircraft carrier.**
A.T.	Aircraft tender.
E.C.	**Escort Carrier.**
S.C.	Seaplane carrier.
H.N.S.	Harvey nickel steel.
H.S.	Harveyised or similar hard-faced steel.
K.S.	Krupp steel.
t.	Speed and H.P. at trials (in speed and H.P. columns).
b.p.	Length of ship between perpendiculars.
L.	Light guns under 15 cwt., including boats' guns.
M.	Machine guns.
m.p.p.	Multiple pom poms.

Torpedo Tubes: (D.) = double; (T.) = triple; (Q.) = quadruple; (sub.) = submerged; a.w. = above water.

The following abbreviations are used to distinguish the various types of boilers:—

W.T.	Water-tube boilers, where the type is not known.
A.	Ansaldo.
B.	Belleville.
Bl.	Blechynden.
B. & W.	Babcock and Wilcox.
D'A.	D'Allest.
G.	Guyot.
I.	Indret.
K.	Kanpon.
My.	Miyabara.
Nic.	Niclausse.
Pen.	Penhoet.
T.	Thornycroft.
T.S.	Thornycroft-Schulz.
W.F.	White-Forster.
Y.	Yarrow.

The following abbreviations distinguish types of machinery:—

P.T.	Parsons turbines.
C.T.	Curtis turbines.
B.C.T.	Brown-Curtis turbines.
(G.)	Geared turbines.
D.	Diesel.
Rat.	Rateau.
tur.	Turbines, where the type is not known.
R.	Steam reciprocating engines.
I.C.	Internal combustion engines.
W.G.T.	**Westinghouse geared turbines.**

In later pages (marked P1, P2, etc., towards the end of the volume) plans of most of the ships appear.

Unless otherwise stated, the displacements are Standard displacements (i.e. deep less fuel and reserve feed water).

GREAT BRITAIN—BATTLESHIPS AND BATTLE CRUISERS.

Class	NAME	Standard Displacement	Length (extreme)	Beam (extreme)	Normal draught	Horse power Type of boilers	Where built	Makers of engines Type of machinery	Date of launch	Date of completion	Cost	Armour						Armament		Speed	Complement (war)
												Belt	Deck	Side above belt	Bulkhead	Gun Position		Guns	Torpedo tubes		
																Heavy guns	Secondary				
		tons	ft.	ft. in.	ft. in.						£	in.	in.	in.	in.	in.	in.			knots	
b.	**Vanguard**	42,500					J. Brown	J. Brown P.T.(G.)	1944	1946								8 *15-in.* guns.			
b.	**King George V**	35,000	745	103 0	28 0	110,000	Vickers (Walker)	Vickers (Barrow) P.T.(G.)	1939	1941								10 *14-in.*, 16 *5;25-in.*; many light A.A. guns; 4 aircraft; catapult.	Nil	28+	1500
b.	**Duke of York**	,,	,,	,,	,,	,,	J. Brown	J. Brown P.T.(G.)	1939	1941								,, ,,	,,	,,	,,
b.	**Howe**	,,	,,	,,	,,	,,	Fairfield	Fairfield P.T.(G.)	1940	1942								,, ,,	,,	,,	,,
b.	**Anson** —	,,	,,	,,	,,	,,	Swan Hunter	Wallsend P.T.(G.)	1940	1942								,, ,,	,,	,,	,,
b.	**Nelson**	33,950	710	106 0	30 0	45,000	N'wc'stle-on-Tyne	Wallsend B.C.T.(G.)	1925	1927	6,410,071	14	6½			16–9		9 *16-in.*, 12 *6-in.*, 6 *4·7-in.* A.A; many light A.A. guns.	2 (sub.) 24″	23	1360
b.	**Rodney**	,,	,,	,,	,,	,,	Birkenh'd	Cammell Laird B.C.T.(G.)	1925	1927	6,148,319	,,	,,			,,		,, ,,			1315
b.	— **Ramillies†**	29,150	620¼	‡102 0	29 0	40,000 Y.	Dalmuir	Beardmore, P.T.	1916	1917	3,295,810	13–4	4–1	6	6–4	11	6	8 *15-in.*, 12 *6-in.*, 4 *3-pr.* 2 *2-pr.* m.p.p.; 8 *4-in.* A.A.; many light A.A. guns.	2 (sub.) 21″	23‖	1010
b.	**Resolution**	,,	620¼	‡101 4	,,	,,	Jarrow	Palmer, P.T.	1915	1916	2.449,680	,,	,,	,,	,,	,,	,,				1012
b.	**Revenge**	,,	625¾	‡101 5	,,	,,	Barrow	Vickers P.T.	1915	1916	2,406,368	,,	,,	,,	,,	,,	,,	,, ,,			1104
b.	**Royal Sovereign***	,,	620¾	‡101 6	,,	,,	Portsm'th	Parsons P.T.	1915	1916	2,570,504	,,	,,	,,	,,	,,	,,	,, ,,			

b.	**Malaya¶** †	31,100	640½	104 0	31 3	75,000 B. & W.	Walker	Wallsend P.T.	1915	1916	2,945,709	13–6	3–1	6	4–2	11	6			25‖	1136
b.	**Valiant§**	31,100	639½	‡104 0	31 3	80,000 B. & W.	Govan	Fairfield B.C.T.	1914	1916	2,537,037	13–6	3–1	6	4–2	11	6	8 *15-in.*, 20 *4·5-in.*, many light A.A. guns.		25‖	1136
b.	**Queen Elizabeth§**	31,100	644½	‡104 0	31 3	80,000 B & W.	Portsm'th	Wallsend P.T.	1913	1915	2,473,103	13–4	3–1	6	4–2	11	6	8 *15-in.*, 20 *4·5-in.*, 4 *2-pr.*, m.p.p.; many light A.A. guns.		25‖	1187
b.	**Warspite**† §	30,600	644½	‡104 0	28 2	80,000	Devonp'rt	Hawthorn P.T.	1913	1915	2,518,360	13–6	3–1	6	4–2	11	6			25‖	1130
b.c.	**Renown** §	32,000	794½	102 4	31 0	120,000	Govan	Fairfield B.C.T.	1916	1916	3,117,204	9–3 K.C.	2	6–3	4–3	11–7 K.C.	6 K.C.	6 *15-in.*; 20 *4·5-in.* A.A.; many light A.A. guns; catapult and 4 aircraft.	2 21"	31·5‖	1188

* On loan to Soviet Navy—renamed Archangel.

‡ Over rubbers.

¶ Built at the charge of the Federated Malay States.

† Armament has been removed.

‖ Speed without bulges.

§ Renown modernised in 1939.
Warspite " " 1936.
Valiant " " 1939.
Queen Elizabeth " 1940.

GREAT BRITAIN.—AIRCRAFT CARRIERS.

Class	NAME	Standard displacement	Length (extreme)	Extreme breadth under water over rubbers	Draught	Horse-power Type of boiler	Where built	Maker of engines Type of machinery	Date of launch	Date of completion	Cost	Armour		Armament		Speed	Complement (war)
												Belt Deck	Gun position	Guns	Torpedo tubes		
		tons	ft.	ft. in.	ft. in.						£	in.	in.			knots	
A.C.	**Eagle**						Harland & Wolff (Belfast)	Harland & Wolff	1946					16 *4·5-in.* guns			
A.C.	**Ark Royal**						Cammell Laird	Cammell Laird	Bldg.					,, ,,		32	
A.C.	**Indefatigable**	23,000	760	95 9	22 4	140,000	J. Brown	J. Brown	1942	1944				16 *4·5-in* guns.		32	
A.C.	**Implacable**	,,	,,	,,	,,	,,	Fairfield	Fairfield	1942	1944				,, ,,		,,	
A.C.	**Illustrious**	23,000	740	95 9	22 4	111,000	Vickers (Barrow)	Vickers (Barrow)	1939	1940				16 *4·5-in.* guns; 20 smaller.		30½	
A.C.	**Victorious**	,,	,,	,,	,,	,,	Vickers (Walker)	Wallsend	1939	1941				,, ,,		,,	
A.C.	**Formidable**	,,	,,	,,	,,	,,	Harland & Wolff (Belfast)	Harland & Wolff	1939	1940				,, ,,		,,	
A.C.	**Indomitable**	,,	,,	,,	,,	,,	Vickers (Barrow)	Vickers (Barrow)	1940	1941				,, ,,		,,	
A.C.	**Argus**	14,000	567	75 9	21 0	20,000	Dalmuir	Beardmore P.T.	1917	1918	Purchased under construction			4 *3-pr.*, 4 M., 10 L., accommodates 20 aircraft.	—	20	420
A.C.	**Furious**	22,450	786½	90 1§	21 6	90,000 Y.	Walker (Armstrong)	Wallsend Engn'g Co. B.C.T.(G)	1916 As a cruiser	1925 As an aircraft carrier	2,436,603(*a*)	3	7	12 *4-in.* A.A., 4 *2-pr.*, m.p.p.; 46 smaller, 33 aircraft	—	30	728
S.C.	**Pegasus** * (*ex*-Ark Royal)	6900	366	50 10	17 6	3000	Blyth	Blyth S. B. Co. recip.	1914	1914	Purchased under construction			4 M., 10 L., 1 catapult.	—	11	139
S.C.	**Albatross** ¶	4800	443½	61 0	15 6	12,000 P.T. (*a*)	Cockatoo Island	Sydney	1928	1929	266,796			A number of light A.A. guns; 9 seaplanes.	—	21	350
Colossus Class: †† L.A.C.	**Colossus**	14,000	695	80 0	23 0	40,000 P.T.(G.)	Vickers (Walker)	Vickers	1943	1944				6 m.p.p.'s; a number of light A.A. guns.		25	
,,	**Vengeance**	,,	,,	,,	,,	,,	Swann Hunter	Wallsend	1944	1945				,, ,,		,,	
,,	**Venerable**	,,	,,	,,	,,	,,	Cammell Laird	Cammell Laird	1944	1945				,, ,,		,,	
,,	**Glory**	,,	,,	,,	,,	,,	Harland & Wolff	Harland Wolff &	1944	1945				,, ,,		,,	
,,	**Ocean**	,,	,,	,,	,,	,,	Alex. Stephen	Alex. Stephen	1944	1945				,, ,,		,,	

Colossus Class—(*contd.*)	**Perseus**						Vickers (Walker)	Parsons	1944	1945							
L.A.C.	**Theseus**						Fairfields	Fairfields	1944	1946							
	Triumph						Hawthorn Leslie	Hawthorn Leslie	1944	1946							
”	**Warrior** †						Harland & Wolff	Harland & Wolff	1944	1946							
Hermes Class:	**Albion**	18,300							Bldg.					8 *4·5-in.*			
	Bulwark								”								
A.C.	**Centaur**								”								
A.C.	**Hermes**								”								
E.C.	**Arbiter**		492	69 6	28 6				1942–1943	1942–1943				*4-in.*			
E.C.	**Archer**																
E.C.	**Ameer**																
E.C.	**Atheling**																
E.C.	**Attacker**																
E.C.	**Battler**																
E.C.	**Begum**																
E.C.	**Chaser**																
E.C.	**Emperor**																
E.C.	**Empress**																
E.C.	**Fencer**																
E.C.	**Hunter**																
E.C.	**Khedive**																
E.C.	**Nabob**																
E.C.	**Patroller**																
E.C.	**Premier**																
E.C.	**Puncher**																
E.C.	**Pursuer**																
E.C.	**Queen**																
E.C.	**Rajah**																
E.C.	**Ranee**																
E.C.	**Ravager**																
E.C.	**Reaper**																
E.C.	**Ruler**																
E.C.	**Searcher**																
E.C.	**Shah**																
E.C.	**Slinger**																
E.C.	**Smiter**																
E.C.	**Speaker**																
E.C.	**Stalker**																
E.C.	**Striker**																
E.C.	**Thane**																
E.C.	**Tracker**																
E.C.	**Trouncer**																
E.C.	**Trumpeter**																
	—																
E.C.	**Activity**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
E.C.	**Campainia**																
E.C.	**Nairana**																
E.C.	**Pretoria Castle**																
E.C.	**Vindex**																

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* Used for experimental work.

† Royal Canadian Navy.

(*a*) First cost of ship as a cruiser.

¶ Transferred from Royal Australian Navy.

§ Over rubbers; 120 ft. over pallisades.

†† Majestic class (building) are similar to Colossus Class.

GREAT BRITAIN.—CRUISERS.

Class	NAME	Standard displacement	Length (extreme)	Beam (extreme)	Draught	Horse-power. Type of machinery and boilers	Where built	Maker of engines	Date of launch	Date of completion	Cost	Armour		Armament		Speed	Complement (war)
												Belt Deck	Gun position	Guns	Torpedo tubes		
		tons	ft.	ft. in.	ft. in.						£	in.	in.			knots	
Norfolk Class	**Norfolk**	9925	633	66 0	17 0	80,000 P.T.(G.)	Fairfield	Fairfield	1928	1930	2,141,961			6 *8-in.*, 8 *4-in.* A.A., many light A.A. guns.	8 21″ (Q.)	32¼	685
London Class	**Sussex**	9830	633	66 0	17 0	80,000 P.T.(G.)	Hawthorn Leslie	Hawthorn Leslie	1928	1929	1,975,800†			8 *8-in.*, 8 *4-in.* A.A., many light A.A. guns.	8 21″ (Q.)	32¼	685
	Devonshire	9850	630	66 0	17 0		Devonp'rt	Vickers	1927	1929	2,007,275			” ”			
	London	9850	630	66 0	17 0		Portsmouth	Fairfield	1927	1929	1,966,559			” ”			
Kent Class	**Suffolk**	10,000	630	68 4	16 7	80,000 (G.) Y.	Portsmouth	Parsons	1926	1928	2,180,240†			8 *8-in.*, 8*4-in.* A.A., many light A.A. guns.	Nil	31½	700
	Berwick	”	”	”	”	”	Govan	Fairfield	1926	1928	2,029,526			” ”			
	Cumberland	”	”	”	”	”	Barrow	Vickers	1926	1928	2,960,821			” ”			
	Kent	”	”	”	”	”	Chatham	Hawthorn	1926	1928	2,084,213†			” ”			
Improved Southampton Class	**Belfast**	10,000	613½	63 4	17 3	80,000 P.T.(G.)	Harland & Wolff	Harland & Wolff	1938	1939	2,176,731			12 *6-in.*, 8 *4-in.* A.A., many smaller, 3 aircraft, 1 catapult.	6 21″ (T)	32½	

South-ampton Class	**Liverpool**	9400	591½	62 4	17 5	82,500 P.T.(G.)	Fairfield	Fairfield	1937	1938				9 *6-in.*, 8 *4-in.* A.A., many smaller.	6 21″ (T)	32	740
	Newcastle	9100	591½	61 8	17 0	75,000 P.T.(G.)	Vickers (Walker)	Vickers	1936	1937	1,960,000			” ”	”	”	”
	Glasgow	”	”	”	”	”	Scotts	Scotts	1936	1937	”			” ”	”	”	”
	Sheffield	”	”	”	”	”	Vickers (Walker)	Vickers	1936	1937	”			” ”	”	”	”
	Birmingham	”	”	”	”	”	Devonp’rt	J. Brown	1936	1937	”			” ”	”	”	”
	—																
Swiftsure Class	**Swiftsure**	8000	555½	63 0	16 3	72,500 P.T.(G.)	Vickers (Walker)	Vickers	1943	1944				9 *6-in.*, 10 *4-in.*, 4 m.p.p., several smaller.	6 21″ (T)	32	
	Superb	”	”	”	”	”	Swan Hunter	Wallsend	1943	1945							
	—																
Uganda Class	**Ceylon**	8000	555½	62 0	16 6	72,500 P.T.(G.)	Stephen	Stephen	1942	1943				9 *6-in.*, 8 *4-in.* A.A., 16 smaller.	6 21″ (T)	”	
	Newfoundland	”	”	”	”	”	Swan Hunter	Wallsend	1941	1943				” ”		”	
	—																
Fiji Class	**Bermuda**	8000	555½	62 0	16 6	72,500 P.T.(G.)	J. Brown	J. Brown	1941	1942				12 *6-in.*, 8 *4-in.*, 16 smaller. (Bermuda and Jamaica have 9 6-*in.*)	6 21″ (T)	32	
	Jamaica	”	”	”	”	”	Vickers	Vickers	1940	1942				” ”	”	”	
	Mauritius	”	”	”	”	”	Swan Hunter	Wallsend	1939	1941				” ”	”	”	
	Kenya	”	”	”	”	”	Stephen	Stephen	1939	1940				” ”	”	”	
	Nigeria	”	”	”	”	”	Vickers	Parsons	1939	1940				” ”	”	”	
	—																
Arethusa Class	**Aurora**	5270	506	51 0	13 10	64,000 P.T.(G.)	Ports-mouth	Wallsend	1936	1937	1,233,921			6 *6-in.*, 8 *4-in.* A.A., 9 smaller.	6 21″ (T)	32½	500
	Arethusa	5220	”	”	”	”	Chatham	Parsons	1934	1935	1,280,463			” ”	”	”	
	—																
Leander Class	**Ajax**	6985	554½	55 8	16 0	72,000 P.T.(G.)	Vickers	Vickers	1934	1935	1,491,417			8 *6-in.*, 8 *4-in.* A.A., many light A.A. guns.	8 21″ (Q.)	32½	570
	Orion	7215	”	”	”	”	Devonp’rt	Vickers	1932	1934	1,548,663			” ”	”	”	”
	Leander	7270	”	55 2	”	”	”	”	1931	1933	1,667,819			” ”	”	”	”

† Estimated cost, excluding armament and ordnance stores.

GREAT BRITAIN.—CRUISERS—*continued.*

Class	NAME	Standard displacement	Length (extreme)	Beam (extreme)	Draught	Horse-power. Type of machinery and boilers	Where built	Maker of engines	Date of launch	Date of completion	Cost	Armour		Armament		Speed	Complement (war)
												Belt	Gun position	Guns	Torpedo tubes		
		tons	ft.	ft. in.	ft. in.						£	in.	in.			knots	
D Class	**Diomede**	4850	471¼	46 3	14 3	40,000 (G.) Y.	Vickers	Vickers	1919	1922	1,146,904	3	Shields	6 6-*in.*, 3 4-*in.* A.A., 2 M., 2 2-*pr.* Pom Poms.		29	460
	Despatch	„	–472¾	–46 9	„		Fairfield	Fairfield	1919	1922	1,016,870	„	„			„	„
	Delhi	„	„	„	„	„	Armstrong	Wallsend	1918	1919	785,145	„	„	„ „		„	„
	Danaë*	„	„	„	„	„	Armstrong	Wallsend	1918	1918	701,600	„	„	„ „		„	„
	Dauntless	„	„	„	„	„	Palmers	Palmers	1918	1918	750,025	„	„	„ „		„	„
Hawkins Class	**Frobisher**	9860	605	65 1	17 3	65,000 B.C.T.(G.)	Devonport	Wallsend	1920	1924	2,035,915	3	Shields	5 7·5-*in.*, 5 4-*in.* A.A., 2 2-*pr*,. 2 M., 8 L.	4 21″ (Q)	30½	715
	Hawkins	9800	„	65 1	„	55,000 P.T.(G.) Y.	Chatham	Parsons	1917	1919	1,599,741	„	„	„ „		29½	747
Carlisle Class	**Capetown**	4200	451¾	43 10	14 1	40,000 (G.) Y.	Cammell Laird	Cammell Laird	1919	1922	984,720	3		2–6 4-*in.* guns.		29	415
	Colombo	„	„	„	„	„	Fairfield	Fairfield	1918	1919	692,308	„		„ „		„	„
	Carlisle	„	„	„	„	„	Fairfield	Fairfield	1918	1918	669,216	„		„ „		„	„
Ceres Class	**Cardiff**	4290	450	43 9	14 1	40,000 (G.) Y.	Fairfield	Fairfield	1917	1917	542,507	3		5 6-*in.*, 2 3-*in.* A.A., 2 2-*pr.* Pom Poms; 8 L.	8 21″ (D)	29	430
	Ceres	„	„	„	„		J. Brown	J. Brown	1917	1917	529,248	„				„	„
Caledon Class	**Caledon**	4180	450	43 1	14 1	40,000 P.T.(G.) Y.	Cammell Laird	Cammell Laird	1916	1917	547,300	3		5 6-*in.*, 2 2-*pr.* Pom Poms, 2 M., 8 L. (Caledon has 6 4-*in.* guns).	8 21″	29	420
	Caradoc	„	„	„	„	„	Scotts	Scotts	1916	1917	534,583	„			„	„	„

E Class	**Emerald**	7550	570	54 7	16 8	80,000 B.C. (G.) Y.	Armstrong	Wallsend	1920	1926	1,617,120	3–1½		7 *6-in.*, 3 *4-in.* A.A., 2 *2-pr.* Pom Poms, 7 smaller.	8 21" (Q)	30	577
	Enterprise	7580	„	54 9	„	„	J. Brown	J. Brown	1919	1926	1,690,658	1				„	„
Dido Class	**Argonaut**	5450	506	50 5	14 0	62,000 P.T.(G.)	Cammell Laird	Cammell Laird	1941	1942				8 *5·25-in.* (Dido and Sirius have 10 *5·25-in.*, and Scylla has 8 *4·5-in.*). many light A.A. guns.	6 21" (T)	33	
	Bellona	„	„	„	„	„	Fairfields	Fairfields	1942	1943						„	
	Black Prince	„	„	„	„	„	Harland & Wolff	Harland & Wolff	1942	1943					„	„	
	Cleopatra	„	„	„	„	„	Hawthorn	Hawthorn	1940	1941					„	„	
	Diadem	„	„	„	„	„	Hawthorn	Hawthorn	1942	1944				„ „	„	„	
	Dido	„	„	„	„	„	Cammell Laird	Cammell Laird	1939	1940				„ „	„	„	
	Euryalus	„	„	„	„	„	Chatham	Hawthorn	1940	1941				„ „	„	„	
	Phoebe	„	„	„	„	„	Fairfields	Fairfields	1939	1940				„ „	„	„	
	Royalist	„	„	„	„	„	Scotts	Scotts	1942	1943				„ „	„	„	
	Scylla	„	„	„	„	„	Scotts	Scotts	1940	1942				„ „	„	„	
	Sirius	„	„	„	„	„	Ports-mouth	Scotts	1940	1942				„ „	„	„	
Hawkins Class	**Vindictive** †	9100	605	65 2	17 3	25,000 P.T.(G.)	Harland & Wolff	Harland & Wolff	1918	1918	1,671,712	3	Shields	2 *4·7-in.*, 4 *3-pr.* 1 *2-pr.*, Pom Pom, 2 M., 8 L.	..	20	720
M. Cr. Class	**Adventure**	6740	539	59 0	15 5	40,000 Tur. & Diesel	Devonport	Vickers	1924	1927	1,246,083			4 *4·7-in.*, A.A., 4 *3-pr.*, 4 *2-pr.* Pom Poms, 4 M., 8 L., 310 mines	..	28	700

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* On loan to Polish Navy—renamed Conrad.

† Vindictive is demilitarised and employed as a cadets' training ship.

GREAT BRITAIN.—FLOTILLAS.

DESTROYERS.

Name or Number	Built by	Completed	Dimensions: Length (extreme)	Dimensions: Beam	Dimensions: Draught	Number of screws	Standard displacement	Horse-power	Mean speed on trial, or expected	Armament	Torpedo tubes	Complement (war)
DESTROYERS—			Feet	Feet	Feet		Tons		Knots			
Battle Class :						2	2325	59,000	36	4 4·5-in. 8 40 mm.	8 21" (Q)	
Armada (Ldr.)	Hawthorne Leslie											
Saintes (Ldr.)	,,											
Solebay	,,											
Cadiz	Fairfields											
St. James	,,											
Vigo	,,											
Gravelines	Cammell Laird											
Sluys	,,											
Trafalgar (Ldr.)	Swan Hunter					2	2325	59,000	36	4 4·5-in. 8 40 mm.	8 21" (Q)	
Barfleur (Ldr.)	,,											
St. Kitts	,,											
Gabbard	,,											
Lagos	Cammell Laird											
Hogue	,,											
Finisterre	Fairfield											
Camperdown	,,											
Cossack Class :												
Cossack (Ldr.)	Vickers (Walker)		362¾	35¾	10	2	1710	40,000	37	4 4·5-in.	,,	
Cockade	Yarrow											
Comet	,,											
Constance (Ldr.)	Vickers (Walker)											
Comus	Thornycroft											
Corso	,,											
Contest	J. S. White											
Consort	Alexr. Stephen											
Chequers Class :												
Chequers (Ldr.)	Scott		,,	,,	,,	,,	,,	,,	,,	,,	,,	
Chaplet	Thornycroft											
Chevron	Alexr. Stephen											
Chieftain (Ldr.)	Scott											
Charity	Thorneycroft											
Cheviot	Alexr. Stephen											
Childers	Denny											
Chivalrous	,,											
Cæsar Class :												
Cavendish (Ldr.)	John Brown		,,	,,	,,	,,	,,	,,	,,	,,	,,	
Cæsar (Ldr.)	,,											
Carysfort	J. S. White											
Carron	Scott											
Cavalier	J. S. White											
Cassandra	Yarrow											
Caprice	,,											
Cambrian	Scott											
Zambesi Class :												
Zephyr (Ldr.)	Vickers (Walker		,,	,,	,,	,,	,,	,,	,,	,,	,,	
Myngs (Ldr.)	,,											
Zenith	Denny											
Zodiac	Thornycroft											
Zebra	Denny											
Zealous	Cammell Laird											
Zambesi	,,											
Zest	Thornycroft											
Wager Class :												
Kempenfelt (Ldr.)	John Brown		,,	,,	,,	,,	,,	,,	,,	4 4·7-in.	,,	
Whirlwind	Hawthorn Leslie											
Wrangler	Vickers (Barrow)											
Wessex	Fairfields											
Whelp	Hawthorn Leslie											
Wager	John Brown											
Wizard	Vickers (Barrow)											
Wakeful	Fairfield											

Great Britain—*continued.*

Name or number	Built by	Completed	Dimensions			Number of screws	Standard displacement	Horse-power	Mean speed on trial, or expected	Armament	Torpedo tubes	Complement (war).
			Length (extreme)	Beam	Draught							
DESTROYERS—*contd.*			Feet	Feet	Feet		Tons		Knots			
Valentine Class :			362¾	35¾	10	2	1710	40,000	37	4 4·7-in. 1 m.p.p.	8 21″ (Q)	
Volage	J. S. White											
Verulam	Fairfield											
Virago	Swan Hunter											
Vigilant	,,											
Venus	Fairfield											
Ulster Class :												
Grenville (Ldr.)	Swan Hunter	1943–44	,,	,,	,,	,,	,,	,,	,,	,,	,,	
Ulster	,,											
Ulysses	Cammell Laird											
Undaunted	,,											
Undine	Thornycroft											
Urania	Vickers (Barrow)											
Urchin	,,											
Ursa	Thornycroft											
Troubridge Class :												
Troubridge (Ldr.)	J. Brown	1943	,,	,,	,,	,,	,,	,,	,,	,,	,,	
Teazer	Cammell Laird	,,										
Tenacious	,,	,,										
Termigant	Denny	,,										
Terpischore	,,	,,										
Tumult	J. Brown	,,										
Tuscan	Swan Hunter	,,										
Tyrian	,,	,,										
Saumarez Class :												
Saumarez (Ldr.)	Hawthorn Leslie	1943	,,	,,	,,	,,	,,	,,	,,	,,	,,	
Savage	,,	,,										
Scourge	Cammell Laird	,,										
Scorpion	,,	,,										
Serapis	Scotts	,,										
*Stord	J. S. White	,,										
Rotherham Class :												
Rotherham (Ldr.)	J. Brown	1942–43	358¼	,,	,,	,,	,,	,,	,,	,,	,,	
Racehorse	,,											
Raider	Cammell Laird											
Rapid	,,											
Redoubt	J. Brown											
Relentless	,,											
Rocket	Scotts											
Roebuck	,,											
Quilliam Class :												
Quilliam (Ldr.)	Hawthorn Leslie	1942	,,	,,	,,	,,	,,	,,	,,	,,	,,	
Queenborough	Swan Hunter	,,										
Quadrant	Hawthorn Leslie	,,										
Quality	Swan Hunter	,,										
†Quickmatch	J. S. White	,,										
†Quiberon	,,	,,										
Pakenham Class :												
Paladin	J. Brown	1941–42	345	35	9	2	1540	..	..	4 4-in. 1 m.p.p.	8 21″ (Q)	
Pathfinder	Hawthorn Leslie											
Penn	Vickers (Walker)											
Petard	,, ,,											
Onslow Class :												
Onslow (Ldr.)	J. Brown	1941–42	,,	,,	,,	,,	,,	..	..	4·7-in. or 4·7-in. 1 m.p.p.	8 21″ (Q)	
Obdurate	Denny											
Obedient	Denny											
Offa	Fairfield											
Onslaught	Fairfield											
Opportune	Thornycroft											
Oribi	Fairfield											
Orwell	Thornycroft											
Napier Class :												
†Napier (Ldr.)	Fairfield	1940	356	35¾	,,	,,	1760	,,	36	6 4·7-in.	21″	
†Nepal	Thornycroft	1942										
†Nizam	J. Brown	1941										
†Norman	Thornycroft	1941										
‡Piorun (*ex*-Nerissa)	J. Brown	1940										

* On loan to Royal Norwegian Navy. † On loan to Royal Australian Navy. ‡ On loan to Polish Navy.

Great Britain—*continued.*

Name or Number	Built by	Completed	Dimensions			Number of screws	Standard displacement	Horse-power	Mean speed on trial, or expected	Armament	Torpedo tubes	Complement (war)
			Length (extreme)	Beam	Draught							
DESTROYERS—*contd.*			Feet	Feet	Feet		Tons		Knots			
Milne Class :												
Milne (Ldr.)	Scotts	1942	362	37	10	2	1935	48,000	36·0	6 4·7-in., 1 4-in. A.A.	8 21″	
Marne	Vickers	1941					1920					
Matchless	Stephen	1942					1920					
Meteor	„	1942					1920					
Musketeer	Fairfield	1942					1920					
Laforey Class :												
Lookout	Scotts	1942	„	„	„	2	1920	48,000	36·0	6 4·7-in.	8 21″	
Loyal												
Kelly Class :												
Kelvin	Fairfield	1939	356	35¾	9	2	1760	40,000	36·0	6 4·7-in.	10 21″	
Kimberley	Thornycroft											
Javelin Class :												
Javelin	J. Brown	1939	„	„	„	2	1760	40,000	36·0	6 4·7-in.	10 21″	
Jervis (Ldr.)	Hawthorn Leslie											
Tribal Class :												
Ashanti	Denny	1938	377	36½	..	2	1870	44,000	36·5	6 4·7-in., 2 4-in.	4 21″ (Q)	200
Eskimo	Vickers	1938										
Nubian	Thornycroft	1938										
Tartar	Swan Hunter	1939										
*Bataan	Cockatoo	1942										
*Arunta	„	1942										
*Warramunga	„	1942										
†Haida	Vickers	1943										
†Huron	„	1943										
†Iroquois	„	1942										
Intrepid Class :												
Icarus	J. Brown	1937	323	33	8½	2	1370	34,000	36	4 4·7-in., 6 smaller	10 21″	145
Ilex	„	„	„	„	„	„	„	„	„			„
Impulsive	J. S. White	1938	„	„	„	„	„	„	„	„	„	„
Havant Class :												
Havelock	J. S. White	1940	323	33	8½	2	1400	34,000	35	2 4·7-in., 4 smaller	8 21″	145
Hesperus	Thornycroft											
Highlander	„											
Hero Class :												
Hotspur	Scotts	1936	323	33	8½	2	1340	34,000	36	3 4·7 in., 6 smaller	8 21″	145
Greyhound Class :												
‡Garland	Fairfield	1936	323	33	8½	2	1335	34,000	36	3 4·7-in., 6 smaller	8 21″	145
†Ottawa (*ex*-Griffin)	Vickers											
Fearless Class :												
Faulknor (Ldr.)	Yarrow	1935	343	33¾	9	2	1460	38,000	36¾	3 4·7-in., 1 3-in.A.A.	8 21″	150
Fame	Vickers	1935	329	33¼	8½	2	1350	36,000	36	3 4·7-in., 6 smaller	8 21″	145
Forester	J. S. White											
†Qu'Appelle (*ex*-Foxhound)	J. Brown											
§Saskatchewan (*ex*-Fortune)	„											
Eclipse Class :												
Escapade	Scotts	1936	329	33¼	8½	2	1375	36,000	36	3 4·7-in., 6 smaller	4 21″	145
§Navarinow (*ex*-Enid)	Denny											
†Gatineau (*ex*-Express)	Swan Hunter											
Defender Class :												
Duncan (Ldr.)	Portsmouth	1933	329	33	8½	2	1400	36,000	35¾	3 4·7-in., 6 smaller	4 21″	175
†Kootenay (*ex*-Decoy)	Thornycroft											
Crusader Class :												
†Assiniboine (*ex*-Kempenfelt)	J. S. White	1932	329	33	8½	2	1375	36,000	36	3 4·7 in., 6 smaller	4 21″	175
†Restigoucit's (*ex*-Comet)	Portsmouth											
†St. Laurent (*ex*-Cygnet)	Vickers											

* Royal Australian Navy. † Royal Canadian Navy ‡ On loan to Polish Navy.
§ On loan to Royal Hellenic Navy.

Great Britain—*continued.*

Name or Number	Built by	Completed	Dimensions			Number of screws	Standard displacement	Horse-power	Mean speed on trial, or expected	Armament	Torpedo tubes	Complement (war)
			Length (extreme)	Beam	Draught							
Destroyers—*contd.*			Feet	Feet	Feet		Tons		Knots			
Beagle Class:												
Beagle	J. Brown	1931	323	32¼	8½	2	1360	34,000	35½	3 4·7-in., 6 smaller	4 21″	140
Brilliant	Swan Hunter											
Bulldog												
*Salamis (*ex*-Boreas)	Palmers											
Acasta Class:												
Active	Hawthorn Leslie	1930	323	32¼	8½	2	1350	34,000	35½	2 4·7-in., 6 smaller	8 21″	140
Antelope	Hawthorn Leslie											
Anthony	Scotts											
Admiralty Design:												
Campbell (Ldr.)	Cammell Laird	1918	332½	31¾	12¼	2	1530	40,000	36½	2 4·7-in., 1 3-in. A.A. 6 smaller	6 21″	182
Mackay (Ldr.)	Cammell Laird	1919										
Montrose (Ldr.)	Hawthorn Leslie	1918										
†Stuart (Ldr.)	Hawthorn Leslie	1918										
Thornycroft:												
Keppel	Thornycroft	1925	329	32	12¼	2	1480	40,000	36	2 4·7-in., 5 smaller	6 21″	182
Witch	Thornycroft	1920	312¼	30⅝	10	2	1140	30,000	35	3 4·7-in., 1 12-pr.		130
Viscount	Thornycroft	1918	312¼	30⅝	10	2	1140	80,000	35	2 4-in., 5 smaller		
Wallace	Thornycroft	1919	329¼	32	12¼	2	1480	40,000	36	4 4-in., 4 2-pr.		183
Viceroy	Thornycroft	1918	312	30⅝	10	2	1120	30,000	35	4 4-in., 2 2-pr.		120
‡Skeena	Thornycroft	1931	320	32½	10	2	1340	32,000	35	3 4·7-in., 1 3-in. A.A.	4 21″	140
Admiralty "S" Class:												
Saladin	Stephen	1919	276	26⅝	10⅛	2	905	27,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 D. 21″	103
Sabre	Stephen	1918										
Sardonyx	Stephen	1919										
Scimitar	Brown	1918										
Scout	Brown	1918										
Shikari	Doxford	1924										
Admiralty "R" Class:												
Skate	J. Brown	1917	276	26⅝	8	2	900	27,000	36	1 4-in., 6 smaller	4 21″	103
Admiralty "V" Class:												
Vansittart	Beardmore	1919	312	29½	10⅝	2	1120	27,000	34	"V" Class is armed with 1 or 2 4-in. or 4·7-in. guns.	1 T.	130
Venomous	Brown	1919										
Verity	Brown	1919										
Volunteer	Denny	1919										
Wanderer	Fairfield	1919										
Whitshed	Swan Hunter	1919										
Wivern	J. S. White	1919										
Wolverine	J. S. White	1920										
Worcester	J. S. White	1922										
Windsor	Scott	1918										
Winchester	J. S. White	1918									2 T.	120
Wolfhound	Fairfield	1918										
Westminster	Scott	1918										
Westcott	Denny	1918	312	29½	10·7	2	1100	27,000	34		2 T. 21″	120
Walker	Denny	1918										
Winchelsea	J. S. White	1918										
Vanessa	Beardmore	1918										
Vanity	Beardmore	1918										
Vidette	Stephen	1918										
Vimy (*late* Vancouver)	Beardmore	1918									1 T.	
Vanquisher	Brown	1917	312	29½	10⅝	2	1090	27,000	34		2 T.	
Velox	Brown	1918									1 T.,	
Versatile	Hawthorn Leslie	1917									2 T.	
Vesper	Stephen	1918									2 T.	
Vivacious	Yarrow	1917									1 T.	
Thornycroft Type:												
Amazon	Thornycroft	1927	323	31½	9	2	1350	39,500	37	4 4·7-in., 2 2-pr., 1 M., 4 L.	2 T. 21″	140
Yarrow Type:												
Ambuscade	Yarrow	1927	322	31	8½	2	1170	33,000	37		5 21″	

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* On loan to Royal Hellenic Navy.

† Royal Australian Navy.

‡ Royal Canadian Navy.

Great Britain—*continued*.

Name or Number	Built by	Completed	Dimensions			Number of screws	Standard displacement	Horse-power	Mean speed on trial, or expected	Armament	Torpedo tubes	Complement (war)
			Length (extreme)	Beam	Draught							
DESTROYERS—*contd.*			Feet	Feet	Feet		Tons		Knots			
Hunt Class :												
Adrias (*ex*-Border)*	Swan Hunter	1942	280	31½	8	2	1000	19,000	27½	4 4-in. H.A.	21"	..
Atherstone	Cammell Laird	1940										
Albrighton	John Brown											
Aldenham	Cammell Laird	1942										
Avon Vale	John Brown	1941										
Arendal†	Cammell Laird	1941										
Beaufort	Cammell Laird	1941										
Belvoir	Cammell Laird	1942										
Bicester	Hawthorn Leslie	1942										
Blackmore	Stephen	1942										
Blankney	John Brown	1941										
Bleasdale	Vickers-Armstrong	1942										
Blencathra	Cammell Laird	1940										
Brecon	Thornycroft	1942										
Brissenden	Thornycroft	1941										
Brocklesby	Cammell Laird	1943										
Calpe	Swan Hunter	1941										
Catterick	Vickers-Armstrong	1942										
Cattistock	Yarrow	1940										
Chiddingfold	Scotts											
Cleveland	Yarrow	1940										
Cotswold	Yarrow	1940										
Cottesmore	Yarrow	1940										
Cowdray	Scotts	1942										
Crete (*ex*-Hursley)*	Swan Hunter	1942										
Croome	Stephen	1941										
Derwent	Vickers-Armstrong	1942										
Easton	White	1942										
Eglinton	Vickers-Armstrong	1940										
Eggesford	White	1943										
Eridge	Swan Hunter	1941										
Exmoor (*ex*-Burton)	Swan Hunter	1941										
Farndale	Swan Hunter	1941										
Fernie	John Brown	1940										
Garth	John Brown	1940										
Glaisdale†	Cammell Laird	1942										
Hambledon	Swan Hunter	1940										
Haydon	Vickers-Armstrong	1942										
Holderness	Swan Hunter	1940										
Kanares (*ex*-Hatherleigh)*	Vickers-Armstrong	1942										
Krakowiak (*ex*-Silverton)‡	White	1941										
Lamerton	Swan Hunter	1941										
Lauderdale	Thornycroft	1941										
Ledbury	Thornycroft	1942										
Liddesdale	Vickers-Armstrong	1941										
Melbreak	Swan Hunter	1942										
Mendip	Swan Hunter	1940										
Meynell	Swan Hunter	1940										
Miaoules (*ex*-Modbury)*	Swan Hunter	1942										
Middleton	Vickers-Armstrong	1942										
Oakley (*ex*-Tickham)	Yarrows	1942										
Pindos (*ex*-Bolebroke)*	Swan Hunter	1942										
Pytchley	Scotts	1940										
Quantock	Scotts	1941										
Rockwood	Vickers-Armstrong	1942										
Slazak (*ex*-Bedale)‡	Hawthorn Leslie	1942										
Southdown	White	1940										
Stevenstowe	White	1943										
Talybont	White	1943										
Tanatside	Yarrow	1942										
Tetcott	White	1941										
Themistocles (*ex*-Bramham)*	Stephen	1942										
Wensleydale	Yarrow	1942										
Whaddon	Stephen	1941										
Wheatland	Yarrow	1941										
Wilton	Yarrow	1942										
Zetland	Yarrow	1942										

* On loan to Royal Hellenic Navy. † On loan to Royal Norwegian Navy. ‡ On loan to Polish Navy.

Great Britain—*continued.*

Name or Number.	Built by	Completed	Dimensions			Number of screws	Standard displacement	Horse-power	Mean speed on trial, or expected	Armaments	Torpedo tubes	Complement (war)	Fuel Oil
			Length (extreme)	Beam	Draught								
			Ft.	Ft.	Ft.		Tons		Knots				
DESTROYERS—*contd.*													
Town Class (*ex-U.S.N.*):													
Chesterfield (*ex*-Wood) Clare (*ex*-Upshur) Broadway (*ex*-Hunt) Burnham (*ex*-Alden)	Newport News S.B. Co.	1919–1920	314·4	31	9·8	2	1,190	25,000	35	4 4-in., 1 3-in. A.A.	4 Trip. 21-in.	122	375
Burwell (*ex*-Laub) Ramsey (*ex*-Meade)	Bethlehem	1919	314·4	31	9·8	2	1,190	27,000	35	4 4-in., 1 3-in. A.A.	4 Trip. 21-in.	122	375
Castleton (*ex*-A. Ward) Lancaster (*ex*-Philip)	Bath I.W.	1919–1921	314·4	31	9·5	2	1,090	24,000	35	4 4-in., 1 3-in. A.A.	4 Trip. 21-in.	122	286
Newport (*ex*-Sigourney) *Niagara (*ex*-Thatcher) Charlestown (*ex*-Abbott) Newark (*ex*-Ringgold) Newmarket (*ex*-Robinson)	Fore River Newport News Union I.W.	1918–1920	314·4	31	9·8	2	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 Trip. 21-in.	122	283
Leeds (*ex*-Connor) Lewes (*ex*-Conway)	Cramp	1918	315·5	30·7	9·5	3	1,020	18,500	30	4 4-in., 1 3-in. A.A.	4 Trip. 21-in.	122	260

* Royal Canadian Navy.

Great Britain—*continued.*

SUBMARINES.

Name or number	Where built	Com-pleted	Dimensions			No. of screws	Dis-place-ment	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement (war)
			Length (extreme)	Beam	Draught							
SUBMARINES—			Feet	Feet	Feet		Tons		Knots			
A Class :												
Amphion	Vickers (Barrow)	1945										
Astute	,,	,,										
Triton Class :												
Talent	Vickers (Barrow)	1945	275	26½	12	2	1,090 1,575	2,500 1,450	15¼ 9	1·4 in., 1 smaller	21"	53
Tapir	,,	,,										
Taciturn	,,	1944										
Trump	,,	,,										
Tiptoe	,,	,,										
Thorough	,,	,,										
Terrapin	,,	,,										
Telemachus	,,	1943										
Tantivy	,,	,,										
Tantalus	,,	,,										
Truncheon	Devonport	1945										
Totem	,,	,,										
Thule	,,	1944										
Tudor	,,	,,										
Tireless	Portsmouth	1945										
Turpin	Chatham	,,										
Trenchant	,,	1944										
Tradewind	,,	1943										
Tallyho	Vickers (Barrow)	,,										
Templar	,,	,,										
Truculent	,,	,,										
Tactician	,,	1942										
Taurus	,,	,,										
Trespasser	,,	,,										
Trusty	,,	1941										
Thrasher	Cammell Laird	,,										
Torbay	Chatham	,,										
Tuna	Scott	1940										
Taku	Cammell Laird	,,										
Trident	,,	1939										
Tribune	Scott	,,										
Truant	Vickers (Barrow)	,,										
Token	Portsmouth	1945										
Tabard	Scott	1946										
Thermopylæ	Chatham	1946										
1940 "*S*" *Class :*												
Sentinel	Scott	1946	215	24	10½	2	670 960	1,550 1,330	13¾ 9	1·3 in., 1 smaller	21"	48
Seneschal	,,	1945										
Seadevil	,,	,,										
Scotsman	,,	,,										
Springer	Cammell Laird	1945										
Saga	,,	,,										
Sanguine	,,	,,										
Scorcher	,,	,,										
Spur	,,	,,										
Spearhead	,,	,,										
Sidon	,,	1944										
Sleuth	,,	,,										
Solent	,,	,,										
Selene	,,	,,										
Seascout	,,	,,										
Supreme	,,	,,										
Subtle	,,	,,										
Stygian	,,	,,										
Sturdy	,,	1943										
Statesman	,,	,,										
Spirit	,,	,,										
Storm	,,	,,										
Stoic	,,	,,										
Surf	,,	,,										
Stubborn	,,	,,										
Scythian	Scott	1944										
Spark	,,	,,										
Strongbow	,,	,,										
Spiteful	,,	1943										
Sirdar	,,	,,										
Sea Rover	,,	,,										
Sceptre	,,	,,										
Satyr	,,	,,										

Great Britain—*continued.*

Name or number	Where built	Completed	Dimensions			No. of screws	Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement (war)
			Length (extreme)	Beam	Draught							
SUBMARINES— 1940 "*S*" *Class* -- *contd.*			Feet	Feet	Feet		Tons		Knots			
Shalimar	Chatham	1944										
Sportsman	,,	1943										
Seanymph	Cammell Laird	1942										
Seadog	,,	,,										
Sibyl	,,	,,										
Safari	,,	,,										
Shakespeare	Vickers (Barrow)	,,										
Seraph	,,	,,										
Unity Class ¶ :												
Vagabond	Vickers (Walker)	1945	190	16	13	2	$\frac{540}{730}$	$\frac{615}{825}$	$\frac{11¼}{10}$	1·3-in., 3 smaller	4–6 21″	27
Votary	,,	,,										
Volatile	,,	1944										
Morse	Vickers (Barrow)	,,										
Delphin ‡	,,	,,										
Virulent	Vickers (Walker)	,,										
Varne	,,	,,										
Vulpine	,,	,,										
Voracious	,,	,,										
Utsira *	Vickers (Barrow)	1944										
Doris ‡	,,	,,										
Urtica	,,	,,										
Upshot	,,	,,										
Visigoth	,,	,,										
Virtue	,,	,,										
Vigorous	,,	,,										
Vox	,,	,,										
Vampire	,,	1943										
Pipinos *	,,	,,										
Viking	,,	,,										
Venturer	,,	,,										
Vivid	Vickers (Walker)	1944										
Unswerving	,,	1943										
Uther	,,	,,										
Varangian	,,	,,										
Xifias *	,,	,,										
Vitality	,,	,,										
Amfitriti *	Vickers (Barrow)	,,										
Ula †	,,	,,										
LcCurie	,,	,,										
Universal	,,	,,										
Ultor	,,	,,										
Dzik §	,,	1942										
Unsparing	,,	,,										
Unruly	,,	,,										
Unseen	,,	,,										
Unshaken	,,	,,										
Unrivalled	,,	,,										
Unruffled	,,	,,										
United	,,	,,										
Unbending	,,	1941										
Una	Chatham	,,										
Umbra	Vickers	,,										
Ultimatum	,,	,,										
Uproar	,,	,,										
Sokol §	,,	,,										
Uproar	,,	,,										
Upright	,,	1940										
Porpoise Class : ¶												
Rorqual	Vickers	1935	271½	25½	15	2	$\frac{1,520}{2,157}$	$\frac{3,300}{1,630}$	$\frac{15¾}{8¾}$	1·4-in., 2 smaller	6 21″	55
Odin Class :												
Otus	Vickers	1929	283½	29·8	13·7	. .	$\frac{1,475}{2,038}$	$\frac{4,400}{1,320}$	$\frac{17½}{9}$	1·4-in., 2 Lewis	8 21″	53

* On loan to Royal Hellenic Navy. † On loan to Royal Norwegian Navy. ‡ On loan to French Navy
§ On loan to Polish Navy. ¶ Minelaying submarines.

Great Britain—*continued.*

SLOOPS, FRIGATES, &c.

Name	Displacement	Length (extreme)	Beam (extreme)	Draught	Horse-power	Where built	Maker of machinery	Date of launch	Date of completion	Armament	Speed (knots)	Complement
SLOOPS—	tons	ft. in.	ft. in.	ft. in.								
Modified Black Swan Class :												
Alacrity	1400	299 6	38 6	9 0	4300 P.T. (G.)	Denny	Denny	1944	1945	6 4-in., 10 smaller.	19¾	..
Amethyst						A. Stephen	A. Stephen	1943	1943			
Crane						Denny	Denny	1942	1943			
Cygnet						C. Laird	C. Laird	1942	1942			
Hart						A. Stephen	A. Stephen	1943	1943			
Hind						Denny	Denny	1943	1944			
Modeste						Chatham	Yarrow	1944	1945			
Opossum						Denny	Denny	1944	1945			
Magpie						Thornycroft	Thornycroft	1943	1943			
Mermaid						Denny	Denny	1943	1944			
Peacock						Thornycroft	Thornycroft	1943	1944			
Pheasant						Yarrow	Yarrow	1942	1943			
Redpole						Yarrow	Yarrow	1943	1943			
Starling						Fairfield	Fairfield	1942	1943			
Whimbrel						Yarrow	Yarrow	1942	1943			
Wild Goose						Yarrow	Yarrow	1942	1943			
Woodcock						Fairfield	Fairfield	1942	1943			
Wren						Denny	Denny	1942	1943			
Black Swan Class :												
Black Swan	1250	299 6	37 6	9 0	4300 P.T. (G.)	Yarrow	Yarrow	1939	1940	6 4-in., 10 smaller.	19¼	..
Erne						Furness	R. Westgarth	1940	1941			
Flamingo						Yarrow	Yarrow	1939	1939			
Egret Class :												
Pelican	1250	292 0	37 6	8 4	3600 P.T. (G.)	Thornycroft	Thornycroft	1938	1939	6 4-in., 10 smaller.	19¼	188
Bittern Class :												
Enchantress	1085	282 0	37 0	8 6	3300	J. Brown	J. Brown	1934	1935	6 4-in., 3 smaller.	18¾	125
Stork	1100	282 0	37 0	8 6	3300 P.T. (G.)	Denny	Denny	1936	1936			
Grimsby Class :												
Aberdeen	990	266 0	36 0	7 6	2000 P.T. (G.)	Devonport	Thornycroft	1936	1936	2 4-in., 6 smaller	16½	100
Deptford						Chatham	J. S. White	1935	1935	2 4·7-in. ,,		
Fleetwood						Devonport	Thornycroft	1936	1936	4 4-in. ,,		
Leith						Devonport	J. S. White	1933	1934	2 4·7-in. ,,		
Londonderry						Devonport	J. S. White	1935	1935	4 4-in. ,,		
Lowestoft						Devonport	J. S. White	1934	1934	4 4-in. ,,		
Wellington						Devonport	J. S. White	1934	1935	2 4·7-in. ,,		
Repeat Shoreham Class :												
Falmouth	1060	281 4	35 0	8 3	2000 P.T. (G.)	Devonport	H. Leslie	1932	1932	2 4-in. H.A., 4 smaller.	16½	100
Weston						Devonport	Yarrow	1932	1933			
Shoreham Class :												
Bideford	1105	281 4	35 0	8 3	2000 P.T. (G.)	Devonport	J. S. White	1931	1931	2 4-in. H.A., 6 smaller.	16½	100
Fowey						Devonport	J. S. White	1930	1931			
Rochester						Chatham	J. S. White	1931	1932			
Shoreham						Chatham	J. S. White	1930	1931			
Hastings Class :												
Folkestone	1045	266 4	34 1	9 1	2000 P.T. (G.)	Swan Hunter	H. Leslie	1930	1930	1 4-in.,	16½	100
Scarborough						Swan Hunter	H. Leslie	1930	1930	2 4-in.		
Bridgewater Class :												
Sandwich	1045	266 4	34 1	9 1	2000 P.T. (G.)	H. Leslie	H. Leslie	1928	1929	1 4-in., 10 smaller.	16½	100
FRIGATES—												
Captains Class :												
Affleck												
Aylmer	1300	290 0	35 0	..	..	Built in U.S.A.	..	1943	1943–44	3 3-in., 8 smaller.	20	..
Balfour												
Bentinck												
Bentley												
Berry												
Braithwaite												
Burges												
Byard												
Byron												
Calder												
Conn												

Great Britain—*continued.*

Name	Dis-place-ment	Length (extreme)	Beam (ex-treme)	Draught	Horse-power	Where built	Maker of machinery	Date of launch	Date of completion	Armament	Speed (knots)	Complement
FRIGATES (*cont.*) *Captains Class —contd*	tons	ft. in.	ft. in.	ft. in.								
Cooke	1300	..	..	..	..	Built in U.S.A.	..	1943	1943 –44	3 3-in., 8 smaller.	20	..
Cosby												
Cotton												
Cranstoun												
Cubitt												
Curzon												
Dakins												
Deane												
Domett												
Duckworth												
Duff												
Ekins												
Essington												
Fitzroy												
Gardiner												
Goodson												
Gore												
Halsted												
Hargood												
Holmes												
Hoste												
Hotham												
Inglis												
Inman												
Kempthorne												
Lawson												
Loring												
Louis												
Manners												
Moorsom												
Mounsey												
Narbrough												
Redmill												
Retalick												
Riou												
Rowley												
Rupert												
Rutherford												
Seymour												
Spragge												
Stayner												
Stockham												
Thornborough												
Torrington												
Trollope												
Tyler												
Waldegrave												
Whitaker												
Colony Class :												
Anguilla	1300	304 0	37 6	12 0	5500	Built in U.S.A.	..	1943	1944	3 3-in., 8 smaller.	18	..
Antigua												
Ascension												
Bahamas												
Barbados												
Caicos												
Cayman												
Dominica												
Labuan												
Montserrat												
Nyasaland												
Papua												
Perim												
Pitcairn												
Sarawak												
Seychelles												
Somaliland												
St. Helena												
Tobago												
Tortola												
Zanzibar												
Bay Class :												
Cawsand Bay	1400	307 0	38 9		6500				1945	4 4-in., 10 smaller.	19½	..
Enard Bay												
Largo Bay												
Tremadoc Bay												

Great Britain—*continued.*

Name	Displacement	Length (extreme)	Beam (extreme)	Draught	Horsepower	Where built	Maker of machinery	Date of launch	Date of completion	Armament	Speed (knots)	Complement
FRIGATES (*cont.*)	tons	ft. in.	ft. in.	ft. in.								
Bay Class—contd.												
Carnarvon Bay	1400	307 0	38 9		6500				1945	4 4-in., 10 smaller.	19½	
Burghead Bay												
Start Bay												
Whitesand Bay												
Bigbury Bay												
Cardigan Bay												
St. Brides Bay												
St. Austell Bay												
Veryan Bay												
Widemouth Bay												
Loch Class:												
Loch Achanalt	1445	307 0	38 6	..	6500	..	..	1943 –44	1944	1 4-in., 10 smaller.	19½	..
Loch Alvie												
Loch Dunvegan												
Loch Fada												
Loch Killin												
Loch Morlich												
Loch Ruthven												
Loch Shin												
Loch Insh												
Loch Craggie												
Loch Eck												
Loch Fyne												
Loch Lomond												
Loch Gorm												
Loch Scavaig												
Loch Katrine												
Loch Quoich												
Loch Achray												
Loch Tarbet												
Loch Glendhu												
Loch Mone												
Loch Tralaig												
Loch Killisport												
River Class:												
Aire	1445	303 0	36 6	12 0	6500	..	..	1941 –43	1943 –44	2 4-in., 8 smaller.	20	..
Annan												
Avon												
Awe												
Ballinderry												
Bann												
Barle												
Chelmer												
Cuckmere												
Dart												
Derg												
Deveron												
Dovey												
Ettrick												
Evenlode												
Exe												
Fal												
Findhorn												
Halladale												
Helford												
Helmsdale												
Inver												
Jed												
Kale												
Lochy												
Lossie												
Monnow												
Moyola												
Nadder												
Nene												

Great Britain—*continued.*

Name	Dis-place ment	Length (extreme)	Beam (ex-treme)	Draught	Horse-power	Where built	Maker of machinery	Date of launch	Date of completion	Armament	Speed (knots)	Complement
FRIGATES (*cont.*)	tons	ft. in.	ft. in.	ft. in.								
River Class—contd.												
Ness	1445	303 0	36 6	12 0	6500	..	..	1941 -43	1943 –44	2 4-in, 8 smaller.	20	..
Odzani												
Parret												
Plym												
Ribble												
Rother												
Shiel												
Spey												
Swale												
Taff												
Tay												
Tavy												
Tees												
Teme												
Test												
Teviot												
Towy												
Trent												
Usk												
Wear												
Wye												
CORVETTES—												
Castle Class :												
Allington Castle	1010	..	..	..	2880	..	..	1943	1943 –45	1 4-in. several smaller.	18½	..
Alnwick Castle												
Amberley Castle												
Bamborough Castle												
Berkeley Castle												
Caistor Castle												
Carisbrooke Castle												
Dumbarton Castle												
Fornham Castle												
Flint Castle												
Hadleigh Castle												
Hedingham Castle												
Kenilworth Castle												
Knaresborough Castle												
Lancaster Castle												
Launceston Castle												
Leeds Castle												
Morpeth Castle												
Oakham Castle												
Oxford Castle												
Pevensey Castle												
Portchester Castle												
Rushen Castle												
Tintagel Castle												
Modified Flower Class :												
Dittany	925	2050	33 0	14 6	2800	..	..	1942 –43	1943	1 4-in., 4 smaller.	16	
Honesty												

Great Britain—*continued*.

Name	Displacement	Length (extreme)	Beam (extreme)	Draught	Horse-power	Where built	Maker of machinery	Date of launch	Date of completion	Armament	Speed (knots)	Complement
CORVETTES—*contd.*	tons	ft. in.	ft. in.	ft. in.								
Modified Flower Class—contd.												
Linaria	925	205 0	33 0	14 6	2800	..	..	1942–43	1943	1 4-in., 4 smaller.	16	..
Rosebay												
Smilax												
Statice												
Willowherb												
Flower Class :												
Abelia	,,	,,	,,	,,	,,	Harland & W.	..	1940–41	1940–41	1 4-in., 4 smaller.	..	78–85
Alisma						Harland & W.						
Amaranthus						Fleming & F.						
Anchusa						Harland & W.						
Anemone						Blyth						
Aster						Harland & W.						
Aubrietia						G. Brown						
Azalea						Cook, W. & G.						
Balsom						G. Brown						
Bellwort						G. Brown						
Bergamot						Harland & W.						
Borage						G. Brown						
Bryony						Harland & W.						
Buttercup						Harland & W.						
Camellia						Harland & W.						
Campion						J. Crown						
Campanula						Fleming & F.						
Carnation						Grangemouth						
Celandine						Grangemouth						
Clarkia						Harland & W.						
Clematis						C. Hill						
Clover						Fleming & F.						
Coltsfoot						A. Hall						
Columbine						C. Hill						
Convolvulus						C. Hill						
Cowslip						Harland & W.						
Crocus						A. & J. Inglis						
Cyclamen						J. Lewis						
Delphinium						H. Robb						
Dianella						J. Lewis						
Freesia						Harland & W.						
Fritillary						Harland & W.						
Genista						Harland & W.						
Gentian						Harland & W.						
Geranium						W. Simons						
Gloxinia						Harland & W.						
Godetia						J. Crown						
Heather						Harland & W.						
Hyderabad						A. Hall						
Honeysuckle						Ferguson						
Hydrangea						Ferguson						
Jasmine						Ferguson						
Jonquil						Fleming & F.						
Kingcup						Harland & W.						
La Malouine						Smith's Dock						
Lavender						A. Hall						
Loosestrife						Hall Russell						
Lotus						H. Robb						
Marguerite						Hall Russell						
Meadowsweet						C. Hill						
Mignonette						Hall Russell						
Monkshood						Fleming & F.						
Myosotis						J. Lewis						
Narcissus						J. Lewis						
Nasturtium						Smith's Dock						
Nigella						Philip						
Oxlip						A. & J. Inglis						
Pennywort						A. & J. Inglis						
Pentstemon						Philip						
Petunia						H. Robb						
Pimpernell						Harland & W.						
Poppy						A. Hall						
Potentilla						W. Simons						
Primrose						W. Simons						
Primula						W. Simons						
Rhododendron						Harland & W.						
Rock Rose						C. Hill						
Saxifrage						C. Hill						

Great Britain—*continued.*

Name	Displacement	Length (extreme)	Beam (extreme)	Draught	Horse-power	Where built	Maker of machinery	Date of launch	Date of completion	Armament	Speed (knots)	Complement
CORVETTES—*contd.* *Flower Class—contd.*	tons	ft. in.	ft. in.	ft. in.								
Snowdrop	925	205 0	33 0	14 6	2800	Smith's Dock	..	1940–41	1940–41	1 4-in., 1 smaller	16	78–85
Snowflake						Smith's Dock						
Starwort						A. & J. Inglis						
Stonecrop						Smith's Dock						
Sunflower						Smith's Dock						
Sweetbriar						Smith's Dock						
Thyme						Smith's Dock						
Tulip						Smith's Dock						
Verbena						Smith's Dock						
Vetch						Smith's Dock						
Violet						W. Simons						
Wallflower						Smith's Dock						
Woodruff						W. Simons						
Guillemot Class:												
Guillemot	580	233 0	25 6	6 6	3600 P.T. (G.)	Denny	Denny	1939	1939	1 4-in., 4 smaller.	20	60
Shearwater						J. S. White	J. S. White	1939	1939			
Kingfisher Class:												
Kingfisher	530	243 0	26 6	6 6	3600 P.T. (G.)	Fairfield	Fairfield	1935	1935	1 4-in., 4 smaller.	20	60
Kittiwake						Thornycroft	Thornycroft	1936	1937			
Mallard						Stephen	Stephen	1936	1936			
Puffin						Stephen	Stephen	1936	1936			
Sheldrake						Thornycroft	Thornycroft	1937	1937			
Widgeon						Yarrow	Yarrow	1938	1938			
CUTTERS (*ex-U.S.N.*):												
Banff (*ex*-Saranac)	1900	250 0	42 0	16 0	3000 T.E.	General El.	Westinghouse	1928–30	1928–30	1 4-in., 1 3-in., 6 smaller.	16	..
Fishward (*ex*-Tahoe)						Bethlehem	Westinghouse					
Gorleston (*ex*-Itasca)						General El.	Westinghouse					
Landguard (*ex*-Shoshone)						General El.	Westinghouse					
Lulworth (*ex*-Chelan)						Bethlehem	Westinghouse					
Sennen (*ex*-Champlain)						Bethlehem	Westinghouse					
Totland (*ex*-Cayuga)						United D.D.	Westinghouse					
MINESWEEPERS *Algerine Class:*												
Acute	950	225 0	35 6	10 6	2000	..	..	1942–45	1942–45	1 4-in. H.A., 4 20-mm.	16½	..
Albacore												
Antares												
Arcturus												
Aries												
Bramble												
Brave												
Cadmus												
Chameleon												
Cheerful												
Circe												
Clinton												
Cockatrice												
Coquette												
Courier												
Espiégle												
Fancy												
Fantome												
Felicity												
Fly												
Flying Fish												
Friendship												
Golden Fleece												
Gozo												
Hare												
Hound												
Hydra												
Laertes												

Great Britain—*continued.*

Name	Dis-place-ment	Length (extreme)	Beam (ex-treme)	Draught	Horse-power	Where built	Maker of machinery	Date of launch	Date of completion	Armament	Speed (knots)	Complement
MINESWEEPERS —*contd.*	tons	ft. in.	ft. in.	ft. in.								
Algerine Class —contd.												
Jewel	..	225 0	..	..	..	..	..	1942–45	1942–45	1 4-in. H.A., 4 20-mm.	..	..
Laertes												
Larne												
Lennox												
Liberty												
Lightfoot												
Lioness												
Lysander												
Magicienne												
Marmer												
Maenad												
Mameluke												
Mandate												
Marmion												
Marvel												
Mary Rose												
Melita												
Michael												
Minstrel												
Moon												
Mutine												
Myrmidon												
Mystic												
Nerissa												
Niger												
Octavia												
Onyx												
Orcadia												
Orestes												
Ossory												
Pelorus												
Persian												
Pickle												
Pincher												
Plucky												
Pluto												
Postillion												
Prompt												
Providence												
Rattlesnake												
Ready												
Recruit												
Regulus												
Rifleman												
Rinaldo												
Romola												
Rosamund												
Rosaria												
Rowena												
Seabear												
Serene												
Spanker												
Squirrel												
Stormcloud												
Sylvia												
Tanganyika												
Thisbe												
Truelove												
Vestal												
Wave												
Welcome												
Waterwitch												
Welfare												
Bangor Class :												
Ardrossan	600–700	170–180 0	28 6	9 6	2000 P.T. (G.) or 2600 R.	Blyth		1940–41	1940–42	1 3-in. H.A., several smaller.	16½	..
Bangor						Warland & W.						
Beaumaris						Ailsa						
Blackpool						Harland & W.						
Blyth						Blyth						
Bootle						Ailsa						
Boston						Ailsa						
Bridlington						Denny						
Bridport						Denny						
Brixham						Blyth						
Bude						Lobnitz						

Great Britain—*continued.*

Name	Displacement	Length (extreme)	Beam (extreme)	Draught	Horsepower	Where built	Maker of machinery	Date of launch	Date of completion	Armament	Speed (knots)	Complement
Minesweepers —*contd.*	tons	ft. in.	ft. in.	ft. in.								
Bangor Class—contd.												
Dornoch	600–700	170–0 180	28 6	9 6	2000 P.T. (G.) or 2600 R.	Ailsa	..	1940–41	1940–42	1 3-in. H.A., several smaller	16½	..
Dunbar						Blyth						
Eastbourne						Lobnitz						
Fort York						Dufferin						
Fraserburgh						Lobnitz						
Ilfracombe						Hamilton						
Llandudno						Hamilton						
Lyme Regis						Stephen						
Parrsboro						Dufferin						
Peterhead						Blyth						
Polruan						Ailsa						
Poole						Stephen						
Qualicum						Toronto						
Rhyl						Lobnitz						
Romney						Lobnitz						
Rothesay						Hamilton						
Rye						Ailsa						
Seaham						Lobnitz						
Shippigan						Toronto						
Sidmouth						H. Robb						
Stornoway						H. Robb						
Tadoussac						Toronto						
Tenby						Hamilton						
Wedgeport						Toronto						
Whitehaven						Philip						
Worthing						Philip						
Halcyon Class :												
Gleaner	815	245 0	33 6	7 6	1750 P.T. (G.)	W. Gray	Central Marine	1937	1938	1 4-in., several smaller.	17	80
Hazard						W. Gray	Central Marine	1937	1937			
Jason						Ailsa	Thornycroft	1937	1938			
Seagull						Devonport	Richardsons	1937	1938			
Sharpshooter						Devonport	J. S. White	1936	1937			
Speedy						Hamilton	J. S. White	1938	1939			
Halcyon					1770 R.	J. Brown	J. Brown	1933	1934			
Harrier						Thornycroft	Thornycroft	1934	1934			
Speedwell						Hamilton	Beardmore	1935	1935			
Salamander					2000 R.	J. S. White	J. S. White	1936	1936			
Twin Screw Minesweepers:												
Albury	710	231 0	28 7	9 0	2200 recip.	Ailsa	Ailsa	1918	1919	1 4-in., 1 12-pr. A.A.	16	73
Alresford						Ailsa	W. H. Allen	1919	1919			
Derby						Clyde S.B. Co.	Clyde S.B. Co.	1918	1918			
Fareham						Dunlop, Bremner	Dunlop, Bremner	1918	1918			
Sutton						McMillan	Yarrow	1918	1919			
Saltash						Murdock & Murray	Yarrow	1918	1919			
Saltburn						Murdock & Murray	Yarrow	1918	1919			
Selkirk						Murdock & Murray	D. Rowan	1918	1919			
Ross						Lobnitz	Lobnitz	1919	1919			
Harrow						Eltringham	Wallsend Slipway	1918	1918			
Lydd						Fairfield	Fairfield	1918	1919			
Pangbourne						Lobnitz	Lobnitz	1917	1917			
Tedworth	675	231 0	28 0	9 0	1800 recip.	Simons	Simons	1917	1917	1 3-in. A.A.	16	35
River Gun-boats—												
Locust	585	197 0	33 8	5 0	3800 P.T. (G.)	Yarrow	Yarrow	1939	1940	2 4-in., many smaller.	17	..
Aphis	625	237 6	36 0	4 6	2000 recip.	Ailsa	Ailsa	1915	1915	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.	14	55
Cockchafer						Barclay Curle	Barclay Curle	1915	1916	2 6-in., 1 3-in. A.A., 8 L.		
Scarab						Wood, Skinner	N.E. Marine	1915	1915	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.		
Tarantula						Wood Skinner	N.E. Marine	1915	1916	1 6-in., 1 3-in. A.A., 1 2-pr., 8 L.		
Seamew	262	165 0	27 0	4 6	1370 recip.	Yarrow	Yarrow	1928	1928	2 3-in.	14	

GREAT BRITAIN.—MISCELLANEOUS CRAFT.

Destroyer Depot Ships —Greenwich (1916), 8,100 tons, 2 4-in. guns, 2 3-in. A.A.; Woolicwh (1935), 8,750 tons, 15 knots, 4 4-in. A.A.; Tyne (1941), 11,000 tons, 8 4·5-in. A.A., 2 2-pr. m.p.p., 7,500 S.H.P., 17 knots ;Montclare (1945), 20,000 tons, 4 4-in.

Submarine Depot Ships.—Lucia, 5,800 tons; Cyclops, 11,300 tons, 13 knots; Maidstone (1938) and Forth (1939), 8,900 tons, 17 knots, 8 4·5-in., 4 3-pr.; Adamant, 12,500 tons, 17 knots, 8 4·5-in.; Wolfe (1943), 4 4-in.

Repair Ships. Resource (Vickers', 1930), 12,300 tons, 15 knots, armament 4 4-in. A.A. Unicorn, Perseus, Pioneer, Beauly Firth, Artifex, Ausonia, Wayland, Mullion Cove, Dullisk Cove, Assistance, Diligence.

Minelayers.—Manxman (1941), Ariadne (1943), Apollo (1944), 2,650 tons, 40 knots, 6 4-in. Stonechat, Dabchick, Blackbird, Redshank, Ringdove, Linnet, Sand Martin, Plover, 500–800 tons. Miner I–VIII, lighters.

Surveying Ships.—Endeavour, 1,280 tons, 13 knots, 1 3-pr.; Challenger, 1,140 tons, 1,200 H.P. (recip.), 12½ knots; Franklin, 830 tons, 17 knots, 1 3-pr.; Scott (1939), 815 tons, 17 knots, 1 12-pr. A.A., Investigator.

Non-Magnetic Survey Vessel.—Research, building by Philip at Dartmouth. Sailing vessel. Aux. motor, 160 B.H.P., 770 tons, 6½ knots.

Netlayer and Target Towing Vessels.—Guardian (Chatham, 1931–3), 2,860 tons, 6,500 H.P., 18 knots, 2 4-in. A.A.; Protector (1934 programme), 2,900 tons, 20 knots, 1 4-in.; Brittany.

Boom Defence Vessels.—Bayonet Class (1939), 10 in number, 600 tons, 11 knots, 1 3-in.; Barricade Class (1938–1945), 70 in number, 750 tons, 12 knots, 1 3-in.; about 20 others.

Fleet Target Ship.—Centurion (ex-battleship), 25,500 tons.

Trawlers.—Professor Class (10), 400 tons, 500 H.P.; Round Table Class (6), 440 tons, 360 H.P. (D.); Mersey Class (1918), (6), 500 tons ; Military Class (9), 800 tons, 1,000 H.P. (R.); Fish Class (7), 600 tons, 700 H.P. (R); Hill Class (6), 750 tons, 970 H.P. (R.); Isles Class (130); Dance Class (20); Shakespeare Class (8), and Tree Class (20), 550 tons, 850 H.P. (R.) 12 knots.

Motor Torpedo Boats.—About 200 in number, 35–45 tons, 2 18-in. or 21-in. torpedoes. About 150 in number, 100 tons, 2 21-in. torpedoes.

Steam Gun Boats.—6 in number, 200 tons.

Motor Launches.—A large number, 110 ft., 18 knots and 72 ft., 12 knots.

Motor Minesweepers.—70 in number, 126 ft., 350 tons, 10 knots. 250 in number, 105 ft., 250 tons, 12 knots. About 150 B.Y.M.S., 300 tons, 1 3-in. gun.

Monitors.—Erebus, 7,200 tons, 12 knots, 2 15-in., 8 4-in., 2 3-in. A.A.; 12 smaller guns. Roberts, Abercrombie.

Hospital Ships.—Maine, 10,100 tons. 10 *ex*-merchant vessels.

Store Ships.—Robert Dundas, Robert Middleton, Bacchus, Reliant.

Oil Tankers.—Olna, Wave Regent, Wave Governor, Wave Emperor, Wave Monarch, Wave King, Empire Salvage (1941–5), 16,000–20,000 tons. Abbeydale, Arndale, Bishop Dale, Boardale, Cedardale, Derwentdale, Dewdale, Dingledale, Eagledale, Easedale, Echodale, Ennerdale (1937–39), 11,500 tons D.W., 11½ knots. Olcades, Oligarch Olwen and Olynthus, 9,000 tons D.W., 10½ knots. War Afridi, War Bharata, War Brahmin, War Hindoo, War Krishna, War Nizam, War Pathan, War Pindari, War Sudra, 7,000 tons D.W., 11 knots. Appleleaf, Brambleleaf, Cherryleaf, Orangeleaf, Pearleaf (1917), 5,000 tons D.W., 15 knots. Belgol, Celerol, Mixol, Prestol, Rapidol, Serbol, Thermol (1917), 2,000 tons D.W., 13½ knots. Boxol, Distol Eldorol, Elmol, Hickorol, Kimmerol, Larchol, Limol, Philol, Scotol, Viscol (1917), 1,000 tons D.W., 9 knots.

Landing Ships.—(Dock) 4 in number; (Emergency Repairs) 5 in number; (Fighter Direction) 1 in number; (Stern Chute) 1 in number; (Tank, Mks. 1, 2 and 3) 134 in number.

DEFENCE FORCES OF THE DOMINIONS.

ROYAL AUSTRALIAN NAVY.

Class	NAME	Standard displacement	Length (extreme)	Beam (extreme)	Draught	Horse-power. Type of machinery and boilers	Where built	Maker of engines	Date of launch	Date of completion	Cost.	Armour		Armament		Speed	Complement (war)
												Belt Deck	Gun position	Guns	Torpedo tubes		
		tons	ft.	ft. in.	ft. in.						£	in.	in.			knots	
Kent Class	Australia	9870	630	68 4	16 3	80,000 B.C. (G.) Y.	Brown	Brown	1927	1928				8 8-in., 8 4-in. A.A., 4 2-pr. m.p.p., 4 M., 12 L.	8 21″ a.w. (Q.)	31½	685
	—																
London Class	Shropshire	9830	633	66 0	17 0		Dalmuir	Beardmore	1928	1929	1,941,950					32¼	685
	—																
Modified Leander Class	Hobart (late Apollo)	7000	562	56 8	15 8	72,000 P.T. (G.)	Devonport	Beardmore	1934	1936	1,459,117			8 6-in., 8 4-in. A.A., 18 smaller.	8 21″ (Q.)	32½	590
	—																
Adelaide Type Cruiser	Adelaide	5100	462½	50 1	15 10	25,000 P.T. Y.	Sydney	Sydney	1918	1922		3 —		7 6-in., 2 4-in. A.A., 8 L., 2 M.		25·5	450

DESTROYERS.—Quickmatch, Quiberon, Queenborough, Quality, Quadrant (*ex*-R.N. Quilliam Class); Napier, Nepal, Norman, Nizam (*ex*-R.N. "N" Class); Arunta, Bataan, Warramunga (built at Cockatoo Docks to R.N. Tribal design); Stuart, Vendetta (1918, *ex*-R.N.).

SLOOPS.—Warrego (1940), Swan (1936), 1,060 tons, 16½ knots, 3 4-in., 1 M.M., Moresby.

FRIGATES.—River Class, Barloo, Gascoyne, Burdekin, Hawkesbury (1943), 1,445 tons, 20 knots, 2 4-in.

MINESWEEPERS.—Bathurst Class: Ararat, Ballarat, Bathurst, Benalla, Bendigo, Bowen, Broome, Bunbury, Bundaberg, Burnie, Cairns, Castlemaine, Cessnock, Colac, Cootamundra, Cowra, Deloraine, Dubbo, Echuco, Fremantle, Gawler, Geelding, Geraldton, Gladstone, Glenelg, Goulburn, Gympie, Horsham, Inverell, Ipswich, Junee, Kalgoorlie, Kapunda, Katoomba, Kiama, Latrobe, Launceston, Lismore, Lithgow, Maryborough, Mildura, Parkes, Pirie, Rockhampton, Shepperton, Stawell, Strahan, Tamworth, Toowoomba, Townsville, Wagga, Warrnambool, Whyalla, Woollongong (1940–43), 650–700 tons, 16 knots, 1 4-in., 2 or 3 Oerlikon.

MOTOR LAUNCHES.—Fairmile Type, 36 in number. 5 others.

BOOM DEFENCE VESSELS.—Koala and Kangaroo (1940), 770 tons, 11 knots, 1 12-pr.; Kookaburra (1939), 577 tons, 9½ knots, 1 12-pr., Karangi.

DEPOT SHIP.—Penguin (1917), 3,455 tons, 14 knots, 1–4-in.

MINELAYER.—Bungaree (1937), 3,155 tons gross, 11 knots, 2 4-in., 1 12-pr.

TUGS.—Tancred Sprightly (1942), 570 tons, 1 3-in.; Reserve (1942), 750 tons, 1 3-in.

SALVAGE VESSELS.—Cambrian Salvor, Caledonian Salvor (1943), 1,645 tons.

ROYAL CANADIAN NAVY.

AIRCRAFT CARRIERS AND CRUISERS.

Class	NAME	Standard displacement	Length (extreme)	Beam (extreme)	Draught	Horse-power. Type of machinery and boilers	Where built	Maker of engines	Date of launch	Date of completion	Cost.	Armour		Armament		Speed	Complement
												Belt Deck	Gun position	Guns	Torpedo tubes		
Colossus Class		tons	ft.	ft. in.	ft. in.						£	in.	in.				
L.A.C.	**Magnificent**								Bldg.								
L.A.C.	**Warrior**																
	—																
A.M. Cr.	**Prince David**	7000	385	57 0	21 0									— *4-in.*		24	241
A.M. Cr.	**Prince Henry**	„	„	„	„												
A.M. Cr.	**Prince Robert**	„	„	„	„												
	—																
Uganda Class Cr.	**Uganda**	8000	555½	62 0	16 6	72,000 P.T.(G.)	Vickers	Parsons	1941	1943				9 *6-in.*, 8 *4-in.* A.A., 16 smaller.	6 21″ (T)	32	
Swiftsure Class Cr.	**Ontario**	„	„	„	„	„	Harland & Wolff	Harland & Wolff	1943	1945				„	„	„	

Destroyers.—Crescent, Croziers, Crystal (*ex*-R.N. " C " Class); Sioux, Algonquin (*ex*-R.N. Valentine Class); Haida, Huron, Iriquois (Tribal design); Ottawa (*ex*-R.N. Greyhound Class); Qu'Appelle, Saskatchewan (*ex*-R.N. Fearless Class); Gatineau (*ex*-R.N. Eclipse Class); Kootenay (*ex*-R.N. Defender Class); Assiniboine, Restigouche, St. Laurent (*ex*-R.N. Crusader Class).

Frigates.—River Class (1942–44), 1,445 tons, 2 4-in. H.A., 20 knots; Annan, Antigonish, Beaconhill, Buckingham, Cap de la Madeleine, Cape Breton, Capiland, Carleton, Carlplace, Charlottetown, Chebogue, Coaticook, Dunver, Eastview, Fort Erie, Glace Bay, Grou, Hallowell, Inch Arran, Joliette, Hulloise, Lanark, La Salle, Lauzon, Levis, Loch Achanalt, Loch Alvie, Loch Matane, Monnow, Montreal, Nadur, New Glasgow, New Waterford, Orkney, Outremont, Penethrig, Port Colborne, Poundmaker, Prestonian, Prince Rupert, Ribble, Rivalmount, Runnymede, St. Catharine's, St. John, St. Pierre, St. Stephen, St. Thomas, St. Therese, Sea Giff, Springhill, Stettler, Stone Town, Stormont, Strathadam, Sussexvale, Swansea, Teme, Thetford Mines, Toronto, Victoriaville, Waskesiu, Wentworth.

Corvettes.—Flower Class (1941–43), 950 tons, 16½ knots, 1 4-in.: Arnprior, Bowmanville, Brantford, Coppercliff, Hespeler, Humberstone, Huntsville, Kincardine, Leaside, Moncton, Naniamo, Orangeville, Petrolia, Sackville, Shediac, Tillsonburg, Woodstock.

Minesweepers.—*Algerine Class* (1943), 850 tons, 1 4-in., 4 Oerlikons: Border Cities, Fort Frances, Kapuskasing, Middlesex, New Liskeard, Oshawa, Portage, Rockcliffe, St. Boniface, Sault, Ste. Marie, Wallaceburg, Winnipeg.

Modified Bangor Class (1942), 590 tons, 16 knots, 1 12-pr., 1 Oerlikon; Brockville, Digby, Granby, Lachine, Melville, Noranda, Transcona, Trois Rivieres, Truro.

Bangor Class (1940–42), 672 tons, 1 4-in., 16 knots; Bellechaise, Blairmore, Burlington, Chignecto, Courtenay, Cowichan, Drummondville, Fort William, Gananoque, Georgian, Goderich, Grandmere, Kelowna, Kenora, Kentville, Mahone, Malpeque, Medicine Hat, Minas, Mirimichi, Mulgrave, Nipigon, Outarde, Port Hope, Quatsino, Quinte, Red Deer, Sarnia, Stratford, Swift Current, Thunder, Ungava, Vegreville, Wasaga, Westmount.

Motor Minesweepers (1944), 120 feet, 10 knots: Coquitlam, Cranbrook, Daerwood, Kalamalica, Lavallee, Llewellyn, Lloyd George, Revelstoke, Rossland, St. Joseph.

Sweeping Mine Trawlers.—Comox, Nandose, Gaspe and Fundy (1938), 668 tons, 12½ knots, 1 4-in.

Armed Yachts.—Beaver, Caribou, Cougar, Elk, Grizzly, Husky, Moose, Reindeer, Renard, Sans Peur, Vison, Wolf.
Training Ships.—Saguenay (1930), ex-destroyer, Niagara.
Icebreakers.—Ernest Lapointe (1941), 1,179 tons gross, 14 knots; Lady Grey (1906), 1,080 tons, 14 knots; M.B. McLean (1930), 5,000 tons, 15 knots.
Tugs.—Ocean Eagle (1919), 420 tons gross, 11½ knots.
Oilers.—Dundalk, Dundurn, Moonbeam, Sunbeam.
Store Carriers.—Preserver, Provider, Laymore, Eastmore.

ROYAL INDIAN NAVY.

Sloops.—Wren Class (1943), 1,250 tons, 6 4-in.; Cauvery, Godavari, Jumna, Kistna, Narbada, Sutlej; Hindustan (1930), 1,190 tons, 2,000 H.P., 16½ knots, 2 4-in., 4 3-pr., 10 smaller guns; Clive (1920), 2,021 tons, 1,700 H.P., 14½ knots, 2 4-in., 2 2-pr., 4 3-pr. guns; Lawrence (1919), 1,259 tons, 1,900 H.P., 15 knots, 2 4-in., 4 3-pr., 2 2-pr. guns; Cornwallis (1917), 1,345 tons, 2,500 H.P., 17 knots, 3 4-in., 4 3-pr., 2 2-pr. guns.

Corvettes.—(Flower Class) 925 tons, 17 knots, 1 4-in. A.A., Assam, Gondwana, Mahratta, Sind.

Minesweepers.—Bangor Class (1941–42), 672 tons, 16 knots, 1 4-in. A.A., I Oerlikon; Baluchistan, Bengal, Bihar, Bombay, Carnatic, Deccan, Kathiawar, Khyber, Konkan, Kumaon, Madras, Orissa, Oudh, Punjab, Rajputana, Rohikhand, a number of Motor Minesweepers.

Trawlers.—(1941–42) Agra, Allahabad, Ahmedabad, Ambala, Amritsar, Bareily, Barisal, Baroda, Benares, Berar, Bihar, Calcutta, Cawnpore, Chittagong, Cochin, Cuttack, Dacca, Dinapur, Gaya, Jubbulpur, Karachi, Lahore, Lucknow, Madura, Monghyr, Multan, Nagpur, Nasik, Patna, Peshawar, Poona, Quetta, Shillong, Sialkot, Sylhet, Travancore, Trichinopoly, Vizagapatam.

Surveying Vessel.—Investigator (1907), 1,172 tons, 1,137 H.P., 13 knots.

Motor Torpedo Boats.—About 20 in number.

Motor Launches.—A number of the Fairmile "B" type.

ROYAL NEW ZEALAND NAVY.

CRUISERS.

Class	NAME	Standard displacement	Length (extreme)	Beam (extreme)	Draught	Horse-power. Type of machinery and boilers	Where built	Maker of engines	Date of launch	Date of completion	Cost.	Armour		Armament		Speed	Complement (war)
												Belt Deck	Gun position	Guns	Torpedo tubes		
		tons	ft.	ft. in.	ft. in.						£	in.	in.			knots	
Leander	**Achilles**	7030	554½	55 8	16 0	72,000	Cammell Laird	Cammell Laird	1932	1933				8 *6-in.*, 8 *4-in.* A.A.	8 21" (Q)	32½	570
Fiji	**Gambia**	8000	555½	62 0	16 6	72,000 P.T.(G.)	Swan Hunter	Wallsend	1940	1942				12 *6-in.*, 8 *4-in.*, 16 smaller.	6 21" (T)	32	

Motor Launches.—Fairmile Type, 12 in No., 16 others.
Corvettes.—Arbutus Arabis (Flower Class).

Trawlers.—Castle Class (1943), 10 in No.; Isles Class (1941), 6 in No.

SOUTH AFRICAN NAVAL FORCES.

Frigates.—Swale (River Class); Good Hope, Natal, Transvaal (Loch Class).
A number of M.T.B.'s, Minesweepers, Coastal Craft and Auxiliaries.

ARGENTINE REPUBLIC.

Class	NAME	Standard Displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour						Armament		Speed	Fuel Oil	Complement
											Belt	Deck	Side above belt	Bulkhead	Gun position: Heavy guns	Gun position: Secondary	Guns	Torpedo tubes			
		tons	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots	tons	
c.	**La Argentina**	6500	535	56	16	54,000 P.T. (G.) Y.	Vickers, Barrow	1937	1938	1,750,000 approx.	3	3					9 *6-in.*, 4 *4-in.* A.A., 2 *3-in.*, 25 A.A. M.G., 1 catapult, 2 aircraft.	6 21″ (T)	30	1000	556 +60 Cdts.
c.	**Almirante Brown**	6495	545¼	58	16¼	100,000 P.T. (G.) Y.	Genoa	1929	1931	1,250,000	3	1			2	2	6 *7·5-in.*, 12 *4-in.* A.A., 6 Pom Poms, 1 catapult, 2 sea-planes.	2 21″	32	1800	600
c.	**Veinticinco de Mayo**	”	”	”	”	”	Leghorn	”	”	”	”	”			”	”		”	”	”	”
d.s.	**General Belgrano**†	6100	328	59¾	24	13,000 R. Y.	Leghorn	1897	1899	696,700	6–3 H.S.	1½	6 H.S.	6 H.S.	6 H.S.	6 H.S.	2 *10-in.*, 8 *4·7-in.*, 4 *6-pr.*, 2 *37-mm.*	—	20	1000	515
d.s.	**Pueyrredon** †	6100	328	59¾	24	13,000 R. Y.	Sestri Ponente	1898	1901	782,000	6–3 H.S.	1½	6 H.S.	5 H.S.	6 H.S.	6 H.S.	2 *10-in.*, 8 *6-in.*, 4 *6-pr.*, 1 *37-mm.*	—	20	1000	430
b.	**Moreno**	27,940	585	97½	28	45,000* C.T. (G.) B. & W.	Camden, N.J. (N.Y.S.B. Co.)	1911	1915	2,200,000	12–10 K.S.	3–2	9–6 K.S.	9 K.S.	12–9 K.S.	6 K.S.	12 *12-in.*, 12 *6-in.*, 4 *3-in.* A.A., 4 *1·85-in.*, 6 M.	2 (sub.) 21″	22·5	4200	1175
b.	**Rivadavia**	”	”	”	”		Quincy, Mass.	”	1914	”	”	”	”	”	”	”			”	”	”

* **Moreno and Rivadavia were converted to oil burning and fitted with geared turbines in 1928.** † **Converted to oil burning and armament altered in 1929. Used as training ships.**

COAST DEFENCE SHIPS.—Libertad and Independencia, 2.510 tons, 13 knots, completed at Birkenhead in 1891–93, and converted to oil fuel **in 1927, carry 2 9·4-in., 4 4·7-in., 4 3-pr. guns,** 2 1·5-in. A.A. RIVER GUNBOATS.—Parana and Rosario (Elswick, 1908), 1,055 tons, 2 6-in. howitzers, 6 3-in., 2 L., 15 knots.

TRAINING SHIP (cruiser).—Presidente Sarmiento (Birkenhead, 1896), 2,320 tons, 15 knots, 3 4·7-in., 1 4-in., 2 3-pr., 3 torpedo tubes.

SURVEYING VESSELS.—Comodoro Rivadavia, ex-San Juan, Bahia Blanca ex-San Luis (Hawthorn Leslie, Newcastle, 1928), 790 tons, 1–3-in.**, 12 knots, Alferez Mackinlay (1914), 783 tons,** 10 knots. SLOOPS.—Murature, King (building), 1,000 tons, 4,000 B.H.P., 16 knots.

TUGS.—Mataco, Toba (completed 1928, at Messrs. Hawthorn Leslie's, Newcastle), Azapardo (1919), Ona, Querandi (Thornycroft, 1914).

MINESWEEPERS.—Comodoro Py, Bouchard, Drummond, Granville, Parker, Robinson, Seaver, Fournier, and Spiro (1937–38); 550 tons, **2,000 H.P., 16 knots, 2 3·9-in., 2 2·9-in. guns;** Bathurst, Golondrina, Pinedo, Segui, Thorne (ex-German, 1917), 500 tons, 17 knots, 3 3-in. guns.

OILERS.—Punta Alta (1937), 800 tons D.W.; Ministro Ezcurra (1914), 10½ knots; Ministro Frere (1927), and Florintino Ameghino.

TRANSPORTS.—Chaco, Pampa (ex-Rio Claro) (1923), 2,100 tons, 11 knots; Patagonia (1925), 9½ knots; I de Mayo; Ushuaia, 1,250 tons, 12 **knots.**

Argentine Republic.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
DESTROYERS—			Feet	Feet	Feet		Tons		Knots				Tons
Cervantes (*ex*-Spanish Churruca	Cartagena	1925	318	31¾	10½	2	1522	42,000	36	5 4·7-in., 1 3-in. A.A., 4 M.	2 triple 21-in.	160	540
Juan de Garay (*ex*-Spanish Alcala Galiano)													
Mendoza	J. S. White	1928	335	31·8	12¾	2	1466	45,000	36 (La Rioja 39·4 *t.*)	5 4·7-in., 1 3-in. A.A., 2 2-pr., 4 M.	2 triple 21-in.	160	700
La Rioja		1929											
Tucuman		1929											
Catamarca	Schichau	1911	288·7	27¼	10	2	972	28,000	32	3 4-in., 2 1-pr.	4 21-in.	100	220
Jujuy	Germania												
Cordoba	Shichau	1910	295½	29·5	10	2	1000	28,000	34·7 *t.*			100	200
La Plata	Germania	1911											
San Juan	J. Brown	1937	323	33	8½	2	1350	34,000	35½	4 4·7-in., 8 smaller.	8 21-in. (Q)	170	450
San Luis													
Misiones	Cammell Laird												
Santa Cruz													
Buenos Aires	Vickers, Barrow												
Entre Rios													
SUBMARINES—													
Santa Fe	Taranto	1931	226¾	21¾	13	2	$\frac{850}{1080}$	$\frac{3000}{1300}$	$\frac{17\cdot5}{9}$	1 4-in., 1 2-pr. A.A.	8 21-in.	41	—
Salta		1932											
Santiago del Estero		1933											

BRAZIL.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour						Armament		Speed	Oil	Com-plement
															Gun position						
											Belt	Deck	Side above Belt	Bulk-heads	Heavy guns	Secondary	Guns	Torpedo tubes			
		tons	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots	tons	
b.	**Minas Gerais** *	19,200	541	83	25	25,000 R. T.	Elswick	1909	1910	1,821,400	9–6–4 K.S.	2	9–6–4 K.S.	9	12–8 K.S.	9 K.S.	12 *12-in.*, 14 *4·7-in.*, 4 *3-in.* A.A.; 2 *3-pr.*, 4 *1·5-in.* M., 8 A.A. M.G.	—	21	—	850
b	**São Paulo** *	”	”	”	”	”	Barrow	1908	1909	”	”	”	”	”	”	”			”		”
l.cr.	†**Rio Grande do Sul**	3150	401½	39	13½	22,000 B.C.T. (G.) T.	Elswick	1909	1910			1½					10 *4·7-in.*, 4 *3-in.*, 4 *3-pr.*	4 21″ (D)	27	600	450

*** Reconstructed and converted to oil fuel, 1934–39, 1937–40 respectively.**

† Reconstructed, including conversion to oil fuel, at Rio de Janeiro, 1926.

Minelayers.—Cananeia, Cabedelo, Camocin, Caravela, Carioca, 188½ feet, 552 tons, 2,500 H.P., 14 knots, 1 4-in. gun, 50 mines; Itapimerim, 118 feet, 150 tons, 2 1·5-in., 30 mines; Itacurussa (1901), 210 tons, 10 knots, 1 1·5-in.

Minesweepers.—Iguape, Itajai (1908), 150 tons, 10 knots, 1·85-in.

River Monitors.—Pernambuco, 470 tons, 11 knots, built at Rio de Janeiro (1910), 2 4·7-in., 2 3-pr. guns; Parnahiyba, 600 tons, 180½ feet in length, 12 knots, 1 6-in. gun, 2 3·4-in.; Paraguassu, 430 tons, 146 feet, 1 4·7-in. gun, 13 knots; Oiapoque (1907), 195 tons, 14 knots, 2 3-pr., 2 M.

Submarine Tender.—Ceará (Spezia, 1916), 4,000 tons, 4,100 H.P., 14 knots, 4 4-in., 4 3-pr.

Repair Ship.—Belmonte (ex-German SS. Valesia), 5,227 tons gross, 4 4·7-in., 6 6-pr., 2,700 H.P., 12 knots.

Training Ship.—Almirante Saldanha, Vickers, (1934). A four-masted schooner, 3,325 tons, 305 feet over all, 4 4-in. and 1 3-in. A.A. guns, 1 21-in. torpedo tube, 1,400 B.H.P. aux., 12 knots.

Survey Vessels.—Rio Branco, 895 tons, 15 knots, 2 6-pr.; Jose Bonifacio, 1,300 tons, 9 knots, 2 4-in., 2 6-pr. Jacequay, 800 tons, 16 knots.

Submarine Chasers.—Guaiba, Guaporé, Gurupi and others (ex-U.S.) (1942–43), 335 tons, 25 knots; Javarí, Jutaí, Jurua, Juruena, Jaguarao, Jaguaribe, Jacui, Jundiai (1942), 100 tons, 20 knots, 1 3-in.; Rio Negro (1943), 137 tons, 20 knots.

Tankers.—Novais de Abreu (1918), 10 knots, 500 tons; Marajo (ex-Malistan, 1924), 5,553 tons gross, 10 knots; Potengi (1938), 600 tons ,10 knots.

Ocean-Going Tugs.—Laurindo Pitta (1910), 514 tons, 850 H.P., 11 knots; Annibal Mendonca (1919), 1,200 H.P., 12 knots, 2 3-pr.; Heitor Perdigao, Muniz Freire, Lomba (1924), 200 tons, 850 H.P., 11 knots, 2 3-pr.

Lightship Tenders.—Lahmeyer, Mario Alves, 280 tons.

Trawlers.—Barreto Menezes, Filipe Camarao, Fernandes Vieira, Henrique Dias, Matias de Albuquerque, Vidal de Negreiros (1941), 12½ knots.

Brazil.

Name or number	Where built	Launched.	Dimensions			Number of screws	Displacement	Horse-power	Speed	Armament	Torpedo tubes	Complement	Fuel Coal / Oil
			Length (extreme)	Beam	Draught								
DESTROYERS—			Feet	Feet	Feet		Tons		Knots				Tons
Amazonas	Rio de Janeiro	Bldg.	323	33		2	1380	43,000 (G.)	36·5	5 5-in., 6 M. A.A.	12 21-in. (Q.)	190	—/500
Araguaia	,,		,,	,,		,,	,,		,,			,,	
Acre	,,		,,	,,		,,	,,	,,	,,	,,	,,	,,	,,
Ajuricaba	,,		,,	,,	,,		,,	,,	,,	,,	,,	,,	,,
Apa	,,		,,	,,		,,	,,	,,	,,	,,	,,	,,	,,
Araguari	,,		,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Greenhalgh	,,	1940	341	34¾	9¼	2	1500	50,000	36	4 5-in.	12 21-in. (Q.)		
Marcilio Dias	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,		
Maris E. Borros	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,		
Piaui	Yarrow	1908	240	23·6	7·5	2	560	8000	27 (27·1–28·7 on trials)	2 4-in., 4 3-pr.	2 18-in.	75	140/—
Matto Grosso		1908											
†Paraiba													
Rio Grande do Norte		1909											
Santa Catarina		1909											
Sergipe		1909											
Marauhao (*ex*-Porpoise)	Thornycroft	1913	265·3	26·5	10	2	934	22,500	31	3 4-in., 1 2-pr.	2 21-in. (D.)	100	—/250
Eight destroyer escorts are on loan from U.S.													
SUBMARINES—													
Humaita	Spezia (Ansaldo Fiat)	1927	282	25·6	14	2	1450/1884	4800/2200	18·5/10	1 4·7-in. A.A.; 4 M., 20 mines	6 21-in.	55	—/140
Tamoia	Spezia (Orlando)	1937	197½	21	14½	2	620/855	1350/8	14/8	1 3·9-in., 2 M. A.A.	6 21-in.	33	. .
Tymbira													
Tupi													

† Training Ship.

CHILE.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour						Armament		Speed	Fuel	Complement
															Gun position						
											Belt	Deck	Side above Belt	Bulkhead	Heavy guns	Secondary	Guns	Torpedo tubes		Coal Oil	
		tons	ft.	ft. in.	ft. in.					£	in.	in.	in.	in.	in.	in.			knots	tons	
b.	**Almirante Latorre*** (ex-H.M.S. Canada)	28,950	661	92 6	29 0	37,000 P.T. Y.	Elswick	1913	1915		9–4	4–2½	4½		10	6	10 *14-in.*, 14 *6-in.*, 4 *4-in.*, A.A., 4 *1·8-in.*, 1 catapult.	4 (sub.) 21″	23	— 4300	1000
cr.	**Chacabuco**	3417	360	46 6	17 0	15,500	Elswick	1898	1891								6 *6-in.*, several smaller.	2 18″			400
cr.	**Blanco Encalada** †	3435	370 p.p.	46 6	19 6	14,500	Elswick	1893	1894			4–1½					2 *8-in.*, 8 *6-in.*, 4 *3-in.*	2 18″	22·7	850 —	385

* Fitted with bulges, converted to oil burning, and modernised in England (completed 1931).

† Training ship.

Oilers (Armstrongs, 1930).—Maipo, Rancagua, 3,080 tons displacement, 2 4·7-in. guns.

Submarine Depot Ship.—Araucano (Vickers-Armstrongs, Barrow), completed 1930, displacement 5,890 tons, armament 2 4·7-in., 2 3-in. A.A., speed 13 knots, H.P. 2,500, 1 seaplane.

Surveying Vessel.—Vidal Gormaz (ex-Jason), 700 tons, 13 knots.

Transport.—Angamos, 3,800 tons, 12 knots; Abtao (1912), 69 tons, 10 knots.

Coastguard Vessels.—Aguila (1941), 1,026 tons, 12 knots; Micalvi (1925), 850 tons, 9½ knots; Elicura, Leucoton, Orompello (1919), 530 tons, 14½ knots, 2 3-in. guns; Yelcho (1906), 467 tons, 12 knots; Condor (1889), 145 tons, 9 knots.

Tugs.—Janequeo, Galvarino. Colocolo, Sobenes, Cabraces (1930), 790 tons, 11 knots; Contramaestro Britto, Pelantaro (1937), 320 tons, 12 knots; Piloto Sibbald (1916), 1,100 tons, 11½ knots.

Chile.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Speed	Armament	Torpedo tubes	Complement	Fuel Coal / Oil
			Length (extreme)	Beam	Draught								
DESTROYERS—			Feet	Feet	Feet		Tons		Knots				Tons
Serrano	Thornycroft's	1928	300	29	9	2	1090	28,000	35	3 4·7-in., 1 3-in.	6 21-in. (r)	130	— / 340
Orella													
Riquelme													
Hyatt													
Videla													
Aldea													
Almirante Lynch	White	1912	320 p.p.	32·6	11·1	3	1850	30,000	31	6 4-in., 4 M.	4 18-in.	190	427 / 80
Almirante Condell		1913											
SUBMARINES—													
Capitan Thompson	Vickers Armstrong's	1929	275	27·5	14·8	2	1520 / 1990	2750 / 1300	15 / 9	1 4-in.	8 21-in.	54	— / 200
Almirante Simpson		1929											
Capitan O'Brien		1928											
H 1. Gualcolda	Fore River, U.S.A.	1915	150·3	15·75	12·3	2	355 / 470	480 / 640	13 / 11	..	4 18-in.	22	— / 17·5
H 2. Tegualda													
H 3. Rucumilla													
H 4. Guale													
H 5. Quidora													
H 6. Fresia													

DENMARK.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Speed	Armament	Torpedo tubes	Complement	Fuel Coal / Oil
			Length (extreme)	Beam	Draught								
FRIGATES			Feet	Feet	Feet		Tons		Knots				Tons
Niels Ebbesen (ex-H.M.S. Annan)		1944	300			2	1370	5,500 (R.)	20	2 4-in. HA/LA, several smaller.	—		
Golger Danske (ex-H.M.S. Monnow)		,,	,,			,,	,,	,,	,,	,,	,,		
CORVETTE													
Thetis (ex-H.M.S. Geranium)		1940	205			1	1000	2,750 (R.)	16½	1 4-in., several smaller.	—		
TORPEDO BOATS													
T4. Glenten	Royal Dockyard, Copenhagen	1934	198·9	19·5	7½	2	285	6,000	27½	2 3·4-in., 2 ·78 M., 2 M.	6	51	— / 40
T5. Hogen		1933	,,	,,	,,	,,	,,	,,	,,		17·7-in.	,,	,,
T6. Ornen		1930	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	26
T3. Laxen	,,	1929	,,	,,	,,	,,	,,	,,	,,	,,	17·7-in.	,,	,,
T1. Dragen	,,	1930	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
T2. Hvalen	,,	,,	,,	,,	,,	,,	,,	,,		,,	,,	,,	
R4. Havkatten ‡	,,	1919	126·3	13·9	9	2	110	2,000	24·6 t.	2·6-pr. A.A.	2 (1 in. R2·4)	24	15 / —
S6. Narhvalen †	,,	1917	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S4. Söhunden †	,,		,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S2. Stören †	,,	1917	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S3. Söridderen †	Yarrow & Co.	1911	126·3	15	9	2	110	2,000	24·3	2 6-pr. A.A.	1 18-in.	24	15 / —
Two in number	Copenhagen	Bldg.	279	27·4	8	2	700	21,000	35	2 4-in., 4 1·5-in.	6 21-in.	..	..
SUBMARINES—													
Havhesten. H4.		1939	155·6	15·3	9·4	2	320 / 420	600 / 220	15 / 8	2 1·5-in.	5 18-in.		20
Havkalen. H3		1937	,,	,,	,,	,,	,,	,,	,,	,,		,,	,,
Havfruen. H2		1937	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Havmanden. H1		1936	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,

† Used as minesweepers. ‡ Used as patrol vessel.

MINELAYERS.—Lossen, 640 tons, 12 knots, 2 3-in., 2 A.A. guns, 175 mines; Sixtus and Kvintus, 186 tons, 8 knots, 2 1-pr. guns, 60 mines; Steamhoat A, 96 tons, 7 knots, 2 M.G.; Lindormen (1941), 500 tons, 14 knots, 2 3-in., Laaland, Lougen, 250 tons, 11 knots.

MINESWEEPERS.—Sohesten and Havhesten, 110 tons, 24·3 knots, 2 2½-in. guns, 1 torpedo tube; Sobjörnen, Soulven, 270 tons, 18 knots, 2 3-in. Eight ex-British M.M.S.'s.

SURVEYING VESSELS.—Hejmdal, 705 tons, 12½ knots, 2 3-in. guns, 4 ·71-in. A.A.; Ternen, 80 tons, 1 1·46-in.; Freja (1940), 315 tons, 10 knots.

FISHERY PROTECTION VESSELS.—Ingolf, 1,180 tons, 16½ knots, 2 4·7-in., 2 2½-in. guns, 1 aircraft; Hvidbjörnen, 1,050 tons, 14½ knots, 2 3½-in. guns; Islands Falk, 730 tons, 13 knots, 2 3-in., 2 1½-in. guns; Beskytteren, 415 tons, 11 knots, 1 2½-in. gun; Maagen, 110 tons, 8 knots, 1 1½-in. gun.

DEPOT SHIPS.—Hekla, Fven.

TRANSPORT SHIPS.—Sleipner, 110 tons, 8·7 knots; Middegrunden, Fremad, Kongedybet. 4 Icebreakers 3 Cable Ships.

ROYAL YACHT.—Daneebrog (1932), 1,130 tons, 14 knots.

FRANCE.—BATTLESHIPS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour						Armament		Speed	Fuel	Complement
											Belt	Deck	Side above Belt	Bulkhead	Gun position		Guns	Torpedo tubes		Coal	
															Heavy guns	Secondary				Oil	
		tons	ft. in.	ft. in.	ft. in.					£	in.	in.	in.	in.	in.	in.			knots	tons	
b.	**Richelieu**	35,000	794 0 W.L.	108 6	26 7	155,000 (G.) I.	Brest	1939	1940		9–16	9			17	5, 2	8 *15-in.*, 9 *6-in.*, A.A., 12 *3-in.*, guns A.A., 67/40 m/m. Bofors A.A., 39/Oerlikons 20 A.A.	Nil	about 31	6000	1959
b.	**Jean Bart**	"	"	"	"	"	St. Nazaire A. C. Loire and Penhoet	1939	1943		"	"							"	"	"
	—																				
b.	**Lorraine**	22,189	544 6	88 6	32 0	42,000 B. P.T.	St. Nazaire—Penhoet	1913	1916	2,642,439	11–7 K.S.	2¼–1¼	7 K.S.	7 K.S.	10½ K.S.	7 K.S.	8 *13·4-in.*, 14 *5·4-in.*, 8 *2·9-in.* A.A., 14/40 A.A. (Bofors), 25 Oerlikons 20 A.A.	Nil	21½	300 2600	1167

Richelieu very completely refitted in U.S.A. (1943–44).
Jean Bart towed uncompleted to Casablanca in June 1940 and remained there until January 1946. Will be completed on similar lines as Richelieu but with an increased armament.
Lorraine reconstructed and modernized between 1934 and 1937.

FRANCE.—AIRCRAFT CARRIERS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power	Where built	Date of launch	Date of completion	Cost	Armour		Armament		Speed	Fuel Oil	Complement
											Belt Deck	Gun position	Guns	Torpedo tubes			
		tons	ft. in.	ft. in.	ft. in.					£	in.	in.			knots	tons	
Aircraft Transport	**Béarn** *	22,146	599 0	115 6	30 6	37,200 Tur. & R.	**La Seyne**	1920	1928		3¼ 1–3		4 *5-in.*, A.A.,24/28 A.A., 26 Oerlikons 20 A.A.		21·5	2070	651
Aircraft Transport	**Commandant Teste** ‖	10,000	548 0	88 7	22 9	21,000 †	**Bordeaux**	1929	1932		2 1½				20·5		648
E.C.	**Dixmude** (Ex-H.M.S. **Biter**)	F. 800	492 0	69 6	28 6	8,500 Diesel	Sun. U.S.A.	1940	1942				— *4-in.*, 20 A.A.		16		

* Originally designed and laid down as a battleship; reconditioned 1935 and 1944/45.

† Schneider-Zoelly turbines (G.). Yarrow-Loire S.T. boilers.

‖ Scuttled at Toulon, 27 November, 1942, but refloated; may be converted into an escort carrier.

FRANCE.—CRUISERS.

Class	NAME	Standard displacement	Length (extreme)		Beam		Draught		Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour		Armament		Speed	Fuel Oil	Complement
														Belt Deck	Gun position	Guns	Torpedo tubes			
		tons	ft.	in.	ft.	in.	ft.	in.					£	in.	in.			knots	tons	
Training cruiser	**Jeanne d'Arc**	6496	557	9	57	5	18	8	32,500	St. Nazaire Penhoet	1930	1931				8 *6·1-in.*, 4 *3-in.* A.A., 14/40 A.A., 20/20 A.A.		26	1400	648
Improved La Galissonière	**De Grasse**	8000	592	0	61	2	18	2	105,000	Lorient	Bldg.					9 *6-in.*, 12 *3·9-in.* A.A., 28/40 A.A.	6 21″		2050	
La Galissonière	**Gloire**	7600	589	0	57	4	17	5	84,000 (G.)	Bordeaux	1935	1937		4⅛	Deck 1½	9 *6-in.*, 8 *3·5-in.* A.A., 24/40 A.A.., 16/20 A.A.	4 21·7″ (D.)	31	1500	264
	Montcalm	"	"		"		"		"	La Seyne	1935	1937		"	"					
	Georges Leygues	"	"		"		"		"	St. Nazaire Penhoet	1935	1937		"	"	" "				
Suffren Class	**Suffren**	10,000	643	0	65	0	24	0	90,000 Rat. (G.) G.	Brest	1927	1930	1,210,000			8 *8-in.*, 8 *3-in.* A.A., 8 *1·46-in.*, A.A., 18/20 A.A., 12/13 A.A.		32	2700	773
Duquesne Class	**Tourville**	10,000	626	8	62	4	23	0	120,000 Rat. (G.) G.	Lorient	1926	1928				8 *8-in.*, 8 *3-in.* A.A., 8/40 A.A., 15/20 A.A.		33·5	2050	620
	Duquesne	"	"		"		"			Brest	1925	1928								
Duguay-Trouin Class	**Duguay-Trouin**	7249	594	10	57	6	20	8	110,000 P.T.(G.) G.	Brest	1923	1928	..	..	..	8 *6·1-in.*, 4 *3-in.* A.A., 6/40 A.A., 20/20 A.A.		34	1480	662
M.Cr.	**Emile Bertin**	5886	580	9	52	0	16	4	102,000 P.T.(G.) Pen.	St. Nazaire	1933	1934	..	..	Deck 2	9 *6-in.*, 8 *3·5-in.* A.A., 16/40 A.A., 20/20 A.A.		34·0	1850	205
Light Cruisers	**Le Fantasque** * **Le Malin** **Le Terrible** **Le Triomphant**	2569	434	6	39	6	14	0	74,000 T.(G.)	Lorient La Seyne Caen Dunkirk A.C. France	1934 1933 1933 1934	1935 1935 1935 1935				5 *5.4-in.*, 8/40 A.A., 10/20 A.A.	6 21.7	37	730	297

* Now rated "light cruisers" under French classification. All reached between 43 and 45·25 on trials and still good for a continuous 37 knots under loaded trim.

FRANCE—*continued.*

Light Escort Vessels.—30 *ex*-American P.C. (6 Sabre, 9 L'Attentif, 15 Carabinier) 1942–43: 300 tons, 20 knots, 1 3-in., 1/40 A.A., 5/20 A.A., numerous depth charges.

Submarine Chasers.—(69 *ex*-American S.C. (CH5, 6, 51, 52, 61, 62, 71, 72, 81/85, 91/96, 101/107, 111/115, 121/126, 131/136, 141/146), 1942–43, 110 tons, 15 knots, 1/40 A.A., 3/20 A.A., numerous depth charges; CH2, 3 (1933–34), 148 tons, 20 knots, 1 3-in., 1/40 A.A., 3/20 A.A. Ch10/15 (1939), 102 tons, 16 knots, 1 3-in., N. 20 A.A.; Ch41/43 (1939), 126 tons, 16 knots, 1 3-in., N. 20 A.A. V101/104 (Fairmile, Canada), 1942, 82 tons, 19 knots, 1/47, 1/20 A.A. 28 *ex*-H.D.M.L. (England), 1941–42, 52 tons, 12 knots.

Motor Torpedo Boats.—M.T.B.90, 91, 92, 94, 98, 229, 239 (1942–43), 45 tons, 40 knots, 1/20 A.A., 4 m.g., 2 torp. M.G.B.120/121 (1945), 65 tons, 40 knots, 12/15 A.A., 8 others bldg. 2 of which as M.T.B., M.G.B.130/131 (1945), 29 tons, 40 knots, 7/15 A.A.

Minesweepers.—30 *ex*-American Y.M.S. (1942–43), 280 tons, 12 knots, 1/3-in. A.A., 2/20 A.A., 2 m.g. 32 *ex*-British M.M.S. (1942–43), 210 tons, 11 knots, 2 m.g.

Patrol Vessels (*ex*-Trawlers).—Le Sétoise, l'Ajaccienne, La Toulonnaise (1934–35), 738 tons, 10 knots, 1 3-in. gun.

Surveying Vessels. Amiral Mouchez (1936), 719 tons, 13 knots, 2 3-in. guns, 4/20; Gaston Rivier, Sentiñelle, Ingen, Hydrographe, Nicolas.

Oilers.—La Drome (1920), 1,055 tons, 1,100 H.P., 10 knots; Le Mèkong (1928), Elorn (1930), Var (1931), 5,482 tons, 4,850 H.P., 13 knots; L'Adour (1938), 4,220 tons, 5,200 H.P. 15 knots; La Charente, La Mayenne (1942–46), 4,289 tons, 5,200 H.P., 15 knots; La Seine, La Saone (bldg.), 19,900 tons, 14,750 H.P., 19 knots; Gasoline Tankers.—2 *ex*-American AOG, L.A.C. Noir, L.A.C. Pavin, 3 *ex*-American YOG, L.A.C. Chambon, L.A.C. Tchad, L.A.C. Tonlésap.

Transports.—Quercy (1938), 4,750 tons, 4,000 H.P., 13 knots; Barfleur (1938), 4,320 tons, 4,000 H.P., 15 knots; Cap des Palmes (1936), 4,160 tons, 4,500 H.P., 17 knots. All of them *ex*-fruit carriers, diesel driven with exceptional endurance, were armed as auxiliary cruisers during the war.

Training Ships.—La Belle Poule, L'Étoile (1932), 227 tons, 120 H.P. auxiliary diesel, 6 knots.

Target Ship.—L'Impassible (1939), 2,410 tons, 12,000 H.P.

Fleet Tugs.—Over 40, 600/1,200 tons, 10/13 knots.

Net Layers.—3 *ex*-American A.N., L'Araignée (*ex*-Hackberry), Scorpion (*ex*-Yew), Tarantule (*ex*-Pepperhead), 700 tons.

Submarine Parent Ship.—Jules Verne (1931), 5,147 tons, 7,000 H.P., 16 knots. At present equipped as a light fleet repair ship. Pollux (1916), an *ex*-Russian ice-breaker, 2,461 tons. 14 knots.

FRANCE.—FLOTILLAS.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
Flotilla Leaders—			Feet	Feet	Feet		Tons		Knots				Tons
Albatros	St. Nazaire Ac. Loire	1930	423	40	14	2	2441	64,000	36	5 5·4-in., 4 1·5-in. A.A.	6 21·7-in.	220	650
Tigre	Nantes Ac. Bretagne	1924	416	37½	17½	2	2126	55,000	35·5	4/5·1-in., 1/40 A.A., 8/20 A.A.	3 21·7-in. (T.)	255	540
*Hoche (*ex*-Z.25)	Deschimag Brime	1942	404	38½	17	2	2400	70,000	37	4 5·9-in., 8/37 A.A., 12/20 A.A.	8 21-in.		820
*Marceau (*ex*-Z.31)	,,	1942	404	38½	17	2	2400	70,000	37	2 5·9-in., 1 4-in. A.A., 14/33 A.A., 8/20 A.A.	8 21-in.		820
*Desaix (*ex*-Z.5)	,,	1935	381	38	16	2	1625	70,000	37	5·5 in., 8/37 A.A., 8/20 A.A.	8 21 in.		700
*Klèber (*ex*-Z.6)	,,	1935	381	38	16	2	1625	70,000	37				700
Destroyers—													
Forbin	Havre	1928	351·7	32·2	10·2	2	1378	31,000 T(G)	3	3 5·1-in., 1/40 A.A., 8/20 A.A.	7 21·7-in. (T.)	165	370
Basque	Maritime	1929											
L'Alcyon	Bordeaux	1926											
Le Fortuné	Caen	1926											
Ouragan	Caen	1924	347	33·0	13·9	2	1319	33,000 T(G)	3	3 5·1-in., 1/40 A.A., 8/20 A.A.	7 21·7-in. (T.)	165	370
Simoun	St. Nazaire	1924											
Tempête	Nantes	1925											
Trombe	Harfleur	1925											
Mistral	Bordeaux	1925											
*Alsacien (*ex*-T23)	Deschimag	1942	319	31	10	2	1100	31,000	31	4 4-in. A.A., 4/37 A.A., 12/20 M.	2 21·7-in. (T.)		290
*Lorrain (*ex*-T28)	,,	1942											290
L'Aventurier	Bordeaux	Bldg.	363¼	36¼	10¼	2	1772	56,000	37	6 5·1-in., 6/40 A.A., 6/20 A.A.	2 21·7 in. (T)		480
Torpedo Boats—													
*Bir Hakeim (*ex*-T6)	Schichau	1939	266	28¼	7	2	600	22,000	33	1 4-in. A.A., 3/37 A.A., 12/20 A.A.	1 21-in. (T.)		200
*Baccarat (*ex*-T11)	,,	1939											
La Melpomene	Nanto	1935	264·9	26	9·2	2	610	22,000	34	2 3·9-in., N/20 A.A.	1 21·7-in. (T.)	131	90
La Flore	,,	1935											
La Cordelière	le Havre	1936											
L'Incomprise	Le Trait	1936											
Bouclier	,,	1937											
Frigates and D.E.													
Sènègalais	U.S.A.	1943	305	31	12	2	1300	6,000 Dies. elect.	20	3 3-in. A.A., 2/40 A.A., 12/20 A.A., 8 mortars, 2 rails for a/s d.ch.		150	340
Algerien	,,	1943											
Tunisien	,,	1943											
Marocain	,,	1944											
Hova	,,	1944											
Somali	,,	1944											
L'Aventure (*ex*-Braid)	England	1943	301½	37	17	2	1445	6,000 Rec.	19	2 4-in., 12/20 A.A., 4 mortars, 2 rails for a/s d.ch.			645
Le Decouverte (*ex*-Windrush)	,,	1943											
L'Escarmouche (*ex*-Frome)	,,	1943											
La Surprise (*ex*-Torridge)	,,	1943											
Croix de Lorraine (*ex*-Strule)	,,	1944											
Tonkinois (*ex*-Moyola)	,,	1944											

* *ex*-German leaders transferred in 2.46.

France—*continued.*

Name or number	Where built	Launched.	Dimensions			Number of screws	Displacement	Horse-power	Speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
CORVETTES—			Feet	Feet	Feet		Tons		Knots				Tons
Cdr. d'Estienne D'Orves (*ex*-Lotus)	England	1941/42	205	33	18		1150 (f.l.)	2,800 Rec.	15	1 4-in., 1 6-pdr., 1/40 A.A., 2/20 A.A., 22 depth ch.		79	230
Cdr. Detroyat (*ex*-Coriander)		,,											
Cdr. Drogou (*ex*-Chrysantenum)		,,											
Roselys (*ex*-Sundew)		,,											
Aconit (*ex*-Aconit)		,,											
Lobelia (*ex*-Lobelia)		,,											
Renoncule (*ex*-Renonculus)		,,											
COLONIAL SLOOPS—													
Dumont Durville	Bordeaux	1931	341	42	16		1969	3,200 (D.)	15·5	3 5·5-in., 4/40 A.A., 11/20 A.A.		176	270
Savorgnan de Brazza	,,	1931											
D'Entre Casteaux	,,	1931											
La Grandiere	Pt. de Bouc	1939											
SLOOPS (for Colonial Surveying Service)													
Laperouse (*ex*-Sans Peur)	St. Nazaire	1942	312	39	11		1559 f.l.	2,300 (D.)	18	Not yet decided.			
Beautemps Beaupré (*ex*-Sans Souci)	,,	1942											
ESCORT VESSELS (fitted as fleet minesweepers)—													
Elan	Lorient	1938	256	28	8		630	4,000 (D.)	20	2 3·9-in. A.A., 2/40 A.A., 4/20 A.A., depth ch.		100	100
Cdt. Bory	Dunkirk	1939											
Cdt. Delage	,,	1939											
Cdt. Duboc	Nantes	1939											
La Capricieuse	,,	1939											
La Moqueuse	Lorient	1940											
Cdt. Domine	Nantes	1939											
La Boudeuse	Dunkirk	1939											
La Gracieuse	Pt. de Bouc	1939											
Bissow	Lorient	1946											
Cdr. Ducuing	Nantes	1946											
Cdr. Amyot Dinville	,,	Bldg.											
Cdr. de Pimdan	Bordeaux	Bldg.											
Chevreuil	Lorient	1939	257	28½	10		647	4,000 (D.)	20	2 3·5 or 3·9-in., 1/40 A.A., 6/20 A.A. or 8/20 A.A.		100	100
Gazelle	,,	1939											
Annamite	,,	1939											
1ST CLASS SUBMARINES													
Archimède	Caen	1930	302·5	27	16		$\frac{1379}{2060}$	6,000/2,000	17/10	1 3·9-in., 2/20 A.A., 10 T. 21·7-in.		83	290
Argo	Nantes	1929											
Le Glorieux	Cherbourg	1931	302·8					6,500/2,000	18/10				
Le Centaure	Brest	1932											
Casabianca	Nantes	1935	302·8					8,000/2,000	19/10				
2ND CLASS SUBMARINES—													
La Crèole	Le Havre	1946	236	22	13½		$\frac{893}{1180}$	$\frac{3,000}{1,400}$	17/10	4/20 A.A., 10 T. 21·7-in.		64	101
L'Artemise	,,	Bldg.											
L'Africaine	Le Trait	Bldg.											
L'Astrèe	Nantes	Bldg.											
L'Andromède	,,	Bldg.											
L'Antigone	Chalons (Schneider)	Bldg.											
Curie (*ex*-P67)	Vickers	1943	200	16	14½		$\frac{626}{721}$	$\frac{800}{760}$	13/9	1 3-in. A.A., 3 M.G., 4 T. 21-in.		37	56
Doris (*ex*-Vineyard)	,,	1944	205	16½	14½		$\frac{648}{732}$						
Morse (*ex*-Vortex)	,,	1944											
Narval (*ex*-Bronzo)	Tarento	1942	197½	21	16½		$\frac{714}{864}$	$\frac{1,600}{800}$	14/7	1 2·9-in., 2/20 A.A., 6 T. 21-in.			

France—*continued.*

Number and name	Where built	Launched	Dimensions			Number of screws	Displacement Surf./Sub.	Horse-power	Speed Surf./Sub.	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
2ND CLASS SUBMARINES—			Feet	Feet	Feet		Tons		Knots				Tons
Junon	Havre	1935	224	17½	13	2	597/800	1300/1230	14/9	1 3-in., 2 M.	9 21·7-in.	43	..
Iris	Dubigeon	1934											
La Vestale	Schneider	1932	210	20	13	2	558–570/787	1300/1000	14/9	1 3-in., A.A.	6 21·7-in. 2 15·7-in.	43	..
La Psyché	Le Havre												
La Sultane	Schneider												
Antiope	Havre	1932	216½	20	13	2	565–571/787	1300/1000	14/9·2	1 3-in. A.A.	6 21·7-in. 2 15·7-in.	43	..
Atalante	Schneider	1930											
Amazone	Le Trait	1932											
Aréthuse	Schneider	1929											
MINELAYING SUBMARINES—													
Rubis	Toulon	1930	216·5	23·3	13·5	2	669/910	1300/800–1000	12/9	1 3-in., 1 M., 32 mines.	5 21·7-in.	40	..
Corail		Bldg.											

French submarines are divided into two classes. 1st class: All vessels of 900 tons and above in the surface condition 2nd class All smaller vessels, including the minelayers.

GREECE.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour						Armament		Speed	Coal Oil	Com-plement
															Gun position						
											Belt	Deck	Side above Belt	Bulk-head	Heavy guns	Secondary	Guns	Torpedo tubes			
		tons	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots	tons	
cr.	**Giorgios Averoff** *	9301	462	69	24¼	19,000 (21,000t) B.	Leghorn (Orlando)	1910	1911	1,100,000	8–3½ K.S.	1¾	7	7	8–6½	7	4 *9·2-in.*, 8 *7·5-in.*, 16 *3-in.*, 4 *3-pr.*, 2 *3-in.* A.A., 2 M.	3 (sub.) *18-in.*	22½ (24 t.) †	1500 —	620

* Refitted 1932.

† Probable speed 15 knots.

Training Ship.—Ares (1929), 1,870 tons, 11 knots, 4 3-in. guns.
Repair Ship.—Hephestos (1920), 4,549 tons gross, 11½ knots, 4 4-in. A.A.
M.T.B's., T1 and T2, Thornycroft type, 55 ft., 37 knots, 2 Lewis guns, 2 T.T., **4 built at Venice, for Customs Service.**
Despatch Vessel and Minelayer.—Tenedos, 450 tons, 13 knots, 40 mines.
Coast Defence Vessel.—Lemnos (ex-U.S.N. Idaho) (1908).
Landing Ship Tanks.—Caios, Lemnos, Lesbos, Samos (Ex-U.S.).
Minesweepers.—8 in number, ex-U.S.N., 290 tons, 1 3-in.
M/S Trawlers.—12 in number.
Motor Launches.—12 in number (ex-British).

Greece.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Maximum trial speed	Armament	Torpedo tubes	Complement	Fuel
			Length (extreme)	Beam	Draught								Coal Oil
DESTROYERS—			Feet	Feet	Feet		Tons		Knots				Tons
Adrias (*ex*-British Hunt Class)	Swan Hunter	1941–42	280	31½	8	2	1000	19,000	27½	4 4-in.	2		
Crete	,, ,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	21-in.		
Kanares	Vickers	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,		
Miaoules	Swan Hunter	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,		
Pindos	,, ,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,		
Themistocles	Stephen	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,		
Paul Coundouriotis	Odero, Genoa	1931	308·8	30·3	10·5	2	1230	30,000	40	4 4·7 in., 4 2-pr. A.A., 40 mines.	3 21-in. (T.)	156	— 630
Spetsai	,, ,,	1931	314·8	30·3	11·3	2	1308	30,000	40				
*Aetos	Birkenhead	1911	293	27·7	9·6	2	1013	19,750	32	4 4-in., 2 2-pr. (50 mines)	3 21-in. (T.)		— 260
*Panther	,,	,,	,,	,,	,,	,,	,,	,,	,,			102	
*Ierax	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,		,,	
Salamis (*ex*-H.M.S. Borias)	Palmers	1930	323	32·3	10·0	2	1360	34,000	36	2 4·7-in.	4 21-in.		
Navarinon (*ex*-H.M.S. Echo)	Denny	1934	329	33·3	10·0	2	1350	36,000	36	3 4·7 in., 1 3-in.	4 21-in.		— 480
TORPEDO BOATS—													
‡Pergamos	Fiume	1914	178·4	18·8	5	2	237	5000	28½	1 11-pr.	3 18-in.	25	21 31
‡Proussa	,,	1914	178·4	18·8	5	2	237	5000	28½	1 11-pr.			
CORVETTES—													
Apostolis (*ex*-British Flower Class)													
Kriezis ,,													
Tombazis ,,													
Saktouris ,,													
5 others ,,							Surf. Sub.		Surf. Sub.				
SUBMARINES—													
Papanicolis	Ch. de la Loire, Nantes	1926	203¾	17·7	12·3	2	567 760	1300 1000	14 9·5	1 4-in., 1 2-pr. A.A.	6 21-in.	30	
Nereus	,,	1927	226½	18¾	12·6	2	689 945	1500 1200	14 9·5	1 4-in., 1 2-pr. A.A.	8 21-in.	42	
Matrozos													
Pipinos (*ex*-British Unity Class)													
Delphin ,,													
Xifias ,,													
1 other ,,													

*** Reconstructed by Messrs. J. S. White & Co., Cowes, 1924–25.**

‡ Surrendered Austrian torpedo-boats.

ITALY.—BATTLESHIPS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour						Armament		Speed	Fuel	Com-plement
											Belt	Deck	Side above Belt	Bulk-head	Gun position: Heavy guns	Gun position: Secondary	Guns	Torpedo tubes		Coal	
		tons	ft. in.	ft. in.	ft.					£	in.	in.	in.	in.	in.	in.			knots	tons	
b.	**Impero** *	35,000	774 0	106 6	28	130,000 P.T. (G.)	Genoa (Ansaldo)	1939			10						9 *15-in.*, 12 *6-in.*, 12 *3·5-in.*, 40 A.A. M.G., 2 catapults, 3 aircraft.		30		1600
b.	**Italia** (ex-**Littorio**	”	”	”	”		Genoa (Ansaldo)	1937	1940												
b.	**Vittorio Veneto**	”	”	”	”	”	Trieste	1937	1940												
b.	**Andrea Doria** †	23,622	611 6	96 0	30	75,000 (G.)	Spezia	1913	1916		10–4 K.S.	1¾	6 K.S.		9½ K.S.	6 K.S.	10 *12·6-in.*, 12 *5·3-in.*, 10 *3·5-in.*, 39 A.A. M.G., 1 catapult, 1 aircraft.		27	2000	1074
b.	**Caio Duilio** †	”	”	”	”	”	Castellammare	1913	1915		”	”	”		”	”			”	”	”
b.	**Giulio Cesare** ‡	”	”	”	”	”	Genoa (Ansaldo)	1911	1914		10–4½ K.S.	1¾	6 K.S.		9½ K.S.	5	10 *12·6-in.*, 12 *4·7-in.*, 8 *3·9-in.* A.A., 36 A.A. M.G., 2 catapults, 4 aircraft.		27	2000	1200

* Building ceased through lack of materials.　† Reconstructed 1940.　‡ Reconstructed 1937.

ITALY.—CRUISERS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour		Armament		Speed	Fuel Oil	Complement
											Side Deck	Gun position	Guns	Torpedo tubes			
		tons	ft. in.	ft. in.	ft. in.					£	in.	in.			knots	tons	
Improved Condottieri " E " Class	**Luigi di Savoia**	7874	613 9	61 0	17	100,000 P.T. (G.)	Odero-Terni, Orlando Spezia	1935	1936		Abt. 6		10 *6-in.*, 8 *3·9-in.* A.A., 8 *1·5-in.* A.A., 8 M., 4 aircraft, 2 catapults. Fitted for minelaying.	6 21″ (T.)	35	1200	600
	Giuseppe Garibaldi	„	„	„	„		Cantieri Riuniti dell' Adriatico, Trieste	„	„		„				„	„	„
	—																
Attendolo Class	**Eugenio di Savoia**	7283	610 8	57 4	16 4	110,000 (G.)	Ansaldo, Genoa	1935	1936		About 4½		8 *6-in.*, 6 *3·9-in.*, 8 *1·5-in.* A.A., 8 *·5-in.* M., 1 catapult, 3 aircraft. Fitted for minelaying.	6 21″ (T.)	36½	1200	550
	Emanuele Filiberto, Duca d'Aosta	„	„	„	„	„	Orlando, Leghorn	„	„		„				„	„	„
	—																
Condottieri " C " Class	**Raimondo Montecuccoli**	6941	597 9	54 6	14·9	106,000 P.T.	Ansaldo, Genoa	1934	1935				8 *6-in.*, 6 *3·9-in.* A.A., 8 *1·5-in.* A.A., 8 *·5-in.* M., 2 aircraft, 1 catapult. Fitted for minelaying.	4 21″ (D.)	37	1200	520
	—																
Condottieri Class	**Luigi Cadorna**	5008	554 6	50 10	14	95,000 (G.)	Stabilimento Tecnico Triestino, Trieste	1931	1933		2/2		8 *6-in.*, 6 *3·9-in.* A.A., 8 *1·5-in.* A.A., 8 *·5* M., 1 catapult, 2 seaplanes.	4 21″ (D.)	37 (39½ t)	1000	530
	—																
Zara Class	**Gorizia**	10,000	599 9	67 7	19 6	95,000 (G.)	Odero-Terni, Orlando	1930	1931		About 6/2		8 *8-in.*, 12 *3·9-in.* A.A., 8 *1·5-in.* A.A., 8 *·5-in.* M. A.A., 1 catapult, 2 seaplanes.	—	32	2200	800
Lcr. Regolo Class	**Attilio Regolo**	3360	444 3	44 9	13	120,000	Leghorn	1941	1942				8 *5·3-in.*, 8 *1·5-in.*, 12 M. A.A., carries mines.	8 21″ (Q.)	41		
	Scipione Africano	„	„	„	„	„	„	1941	1942						„		
	Pompeo Magno	„	„	„	„	„	Ancoma	1942	1942						„		

ITALY.—FLOTILLAS.

Name or number	Where built	Launched	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum trial speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
Destroyers—			Feet	Feet	Feet		Tons		Knots				Tons
Mitragliere	Ancona	1941	341¼	34½		2	1650	45,000	39	4 4·7-in., several smaller A.A.	6 21-in. (T.)	240	
Legionario	Orlando	,,	,,	,,		,,	,,	,,	,,				
Velite	,,	,,	,,	,,		,,	,,	,,	,,				
Granatiere	Palermo	1938	351	33⅓		2	1620	48,000	39	5 4·7-in., several smaller A.A.	6 21-in. (T.)	240	500
Artigliere	Orlando	1937	,,	,,		,,	,,	,,	,,			,,	,,
Fuciliere	Ancona	1938	,,	,,		,,	,,	,,	,,		,,	,,	,,
Carabiniere	Riva Trigoso	,,	,,	,,		,,	,,	,,	,,	,,	,,	,,	,,
Nicoloso da Recco	Ancona	1929	351	33½		2	1590	52,000	38	6 4·7-in., several smaller	3 21-in. (T.)		
Ardimentoso	Ansalso	1942	280	32½		2	1060	16,000	25	2 3·9-in.	4 18-in. (D.)		
Animoso	,,	,,	,,	,,		,,	,,	,,	,,	3 3·9-in.			
Fortunale	Trieste	,,	,,	,,		,,	,,	,,	,,	,,	,,		
Aliseo	Castellamare	1942	,,	,,		,,	1000	,,	,,	,,	,,		
Indomito	Riva Trigoso	1943	,,	,,		,,	,,	,,	,,	,,	,,		
Augusto Riboty	Ansaldo	1916	340	32	9·8	2	1382	35,000	35	8 4-in., 4 2-pr. A.A., 100 mines.	2 18-in. (D.)	150	344
A. Oriani	Orlando	1936	350	33½	10	2	1570	48,000	39	4 4·7-in., 4 1·5-in. A.A., carry mines	6 21-in. (T.)	157	
Grecale	Ancona	1934	350	33⅓	10	2	1449	44,000	38	4 4·7-in., 4 1·5-in. A.A.	6 21-in.	156	600
							Surf. Sub.		Surf. Sub.				
Submarines—													
A. Cagni	Monfalcone	1940	285	25·5	17·2	2	1461 —	4600 —	18 8·9	2 3·9-in., 4 M. A.A.	14 18-in.		
Benedetto Brin	Taranto (Tosi)	1938	231	22½		2	— 1255		17 8·5	1 3·9-in.,.4 M, 10 mines.	8 21-in	52	
Platino	Orlando	1942	197	21½		2			16 8	1 3·9-in., 4 M.	6 21-in.	37	
Nichelio	,,	,,	,,	,,	,,	,,				,,	,,	,,	
Alagi	Adriatico	1936	197½	21	14·4	2	620 844	1350 800	14 8·5	1 3·9-in., 2 M.	6 21-in.	46	
Giada	,,	1942	,,	,,	,,	,,						,,	
Diaspro	Adriatico	1936	197	21	14·4	2	620 844	1350 800	14 8·5	1 3·9-in., 2 M.	6 21-in.	40	
Atropo	Tosi	1937	266¾	23½	12⅓	2	1190 1550	2880 1300	17 8	1 3·9-in., 2 M., 30 mines.	6 21-in.	60	
Zoea	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	
Topazio	Fiume	1933	197	21	12	2	590 787	1350 800	14 8·5	1 3·9-in., 2 M.	6 21-in.		
Galatea	Monfalcone	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,		
Otaria	Monfalcone	1934	240	23½	14½	2	860 1167	3000 1040	17·0 8·5	2 3·9-in., 2 M.	8 21-in.		
Squalo	Cantiere N.	1930	229	19	14·5	2	810 1077	3000 1400	16·5 9	1 4-in., 2 M.		64	
Jalea	Odero-Terni	1932	201·8	18·5	13	2	599 778	1200 800	14 8·5	1 4-in., 2 M. 21-in.	6 21-in.		
Ciro Menotti	Ansaldo	1929	229	19	15·5	2	815 1078	3000 1300	17·5 9	1 4-in., 2 M.	8 21-in.	50	
Fratelli Bandiera	Monfalcone	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	
Luciano Manara	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	
Ruggiero Settimo	Taranto	1930	,,	,,	,,	,,	797 134	3000 1400	,,	,,	,,	,,	
M. Bragadino	Taranto (Tosi)	1929	233	18·6	14	2	802 1051	1500 1000	14 8	1 4-in., 2 M., 24 mines.	4 21 in.	50	41
F. Corridoni	,,	1930	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
H 1, 2, 4	Vickers	1917	150·3	15·8	12	2	336 46	620 480	13 10	1 M. A.A.,	4 18-in.	22	18
Midget Submarines Various		1941–2	52½	10					7 5		2 18-in.	4	

Italy—*continued.*

Name or number	Where built	Launched	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum trial speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
			Feet	Feet	Feet		Tons		Knots				Tons
TORPEDO BOATS—													
Monzambano	Orlando	1923	280	26			1000	22,000 (G.)	33½	4 4-in.	6 18-in.	105	
Orione	Palermo	1937	293	31			860	16,000 (G.)	28	2 3·9-in., 10 M.	4 18-in. (D.)		
Orsa	,,	,,	,,	,,			,,	,,	,,	,,	,,		
Ariete	Ansaldo	1943	271	27			800	,,	30	,,	6 18-in. (T.)		
Lancia	Fiume	,,	,,	,,			,,	,,	,,	,,	,,		
Clio	Ansaldo	1938	267	26			680	19,000 (G.)	34	3 3·9-in.	4 18-in.		
Calliope	,,	,,	,,	,,			,,	,,	,,	,,	,,		
Libra	Fiume	,,	,,	,,			,,	,,	,,	,,	,,		
Aretusa	Ansaldo	,,	,,	,,			,,	,,	,,	,,	,,		
Cassiopea	Liva Trigoso	1936	267	27			650	,,	,,	,,	,,		
Sagittario	Fiume	,,	269	27			,,	,,	,,	,,	,,		
Sirio	,,	,,	,,	,,			,,	,,	,,	,,	,,		
Nicola Fabrizi	Odero	1918	240	24			635	15,000 (G)	32½	4 4-in.	,,		
Giacinto Corini	,,	,,	,,	,,			,,	,,	,,	,,	,,		
Artonio Mosto	Naples	1915	,,	,,			620	,,	,,	5 4-in.	,,		
Guiseppe C. Abba	Odero	,,	,,	,,			,,	,,	,,	,,	,,		
Rosalino Pilo	,,	,,	,,	,,			,,	,,	,,	,,	,,		
Guiseppe Missori	,,	,,	,,	,,			,,	,,	,,	,,	,,		
E. Giovannini	Naples	1922	180	19			180	2,400 (R.)	25	2 4-in.	2 18-in. (D.)		
CORVETTES—													
Ape		1942	207	28			570	3,400 (Dies. elect.)	18½	1 3·9-in., several small A.A.	2 18-in.		
Calabrone		,,	,,	,,			,,	,,	,,	,,	,,		
Chimera		,,	,,	,,			,,	,,	,,	,,	,,		
Cormorano		,,	,,	,,			,,	,,	,,	,,	,,		
Danaide		,,	,,	,,			,,	,,	,,	,,	,,		
Driade		,,	,,	,,			,,	,,	,,	,,	,,		
Fenice		,,	,,	,,			,,	,,	,,	,,	,,		
Flora		,,	,,	,,			,,	,,	,,	,,	,,		
Folaga		,,	,,	,,			,,	,,	,,	,,	,,		
Gabbiano		,,	,,	,,			,,	,,	,,	,,	,,		
Eru		,,	,,	,,			,,	,,	,,	,,	,,		
Ibis		,,	,,	,,			,,	,,	,,	,,	,,		
Minerva		,,	,,	,,			,,	,,	,,	,,	,,		
Baionetta		,,	,,	,,			,,	,,	,,	,,	,,		
Pellicano		,,	,,	,,			,,	,,	,,	,,	,,		
Pomona		,,	,,	,,			,,	,,	,,	,,	,,		
Scimitarra		,,	,,	,,			,,	,,	,,	,,	,,		
Stinge		,,	,,	,,			,,	,,	,,	,,	,,		
Sibilla		,,	,,	,,			,,	,,	,,	,,	,,		
Urania		,,	,,	,,			,,	,,	,,	,,	,,		
Regina Elena		,,	,,	,,			,,	,,	,,	,,	,,		

MINELAYERS.—Azio (1927), 615 tons, 15 knots (recip.), 2 4-in., 1 3-in., 80 mines ; a small number of *ex*-merchant vessels

MINESWEEPERS.—About 12 in number, 150 tons, 14 knots, 1 3-in. gun.

OIL TRANSPORTS.—Tarvisio, 10,910 tons, 11 knots, 4 4·7-in., 2 3-in. ; Urano, 10,550 tons, 11 knots, 2 4·7-in., 2 3-in. ; Prometeo, 1,080 tons, 11 knots, 2 3-in. ; Nettuno, 9,555 tons, 14 knots, 3 4·7-in., 2 3-in. ; Cocito, Lete, 1,162 tons, 10 knots, 3 3-in.

SURVEYING VESSEL.—Cherso, 3,988 tons, 10½ knots, 4 4·7-in. guns.

PATROL VESSELS.—Rimini (1912), 319 tons, 9½ knots, 1 3-in. gun ; Illiria (1918), 654 tons, 11 knots.

TRAINING SHIPS.—Cristoforo Colombo (Castellamare, 1928), 2,787 tons, 10 knots (Diesel-electric), 4 3-in. guns, 2 A.A. M.G. ; Amerigo Vespucci (Castellamare, 1931), 3,543 tons, 1,800 H.P. (Diesel-electric), 11 knots, 4 3-in. A.A., 2 A.A., M.G.

SUBMARINE DEPOT SHIP.—Pacinotti (1924), 2,730 tons, 19 knots, 4 3-in. A.A.

CABLE SHIP.—Giasone, 1,192 tons, 250 ft., 15 knots.

WATER CARRIERS.—Istria, 2,900 tons, 10 knots, 1 4·7-in., 1 3-in. ; Po, 11½ knots, 2 4-in., 4 m.g. ; Tirso, 9½ knots, 4 m.g. ; Mincio, Bormida, 645 tons, 9 knots ; Sesia, 1,050 tons, 9½ knots, 4 M.G. ; Adige (1928), 780 tons, 8 knots ; Arno and Brenta (1929), 630 tons, 9 knots ; Garda, Verbano, Metauro (1934), 592 tons, 9 knots ; Frigido (1912), 398 tons, 9 knots ; Yippacco, Isarco (1925), 265 tons, 9 knots ; Aterno (1914), 250 tons, 8 knots.

LIGHTHOUSE TENDERS.—Scilla, 350 tons, 9 knots, 1 3-in. ; Lido, 226 tons, 12 knots, 1 3-in.

MONITORS.—Monte Grappa, Montello (1919), 605 tons, 7 knots, 1 12-in., 4 3-in. ; Monte Novegno (1919), 502 tons, 7 knots, 1 12-in., 4 3-in.

SLOOP.—Eirtrea, 2,172 tons, 20 knots, 4 4·7-in. guns, fitted for minelaying.

MOTOR VEDETTES.—Vigilante, Vedetta (1938), 85½ ft., 70 tons, 400 H.P. (D.), 12 knots, 1 3-in.

HOSPITAL SHIPS.—Gradisca, Toscana, Principessa Giovanna.

SALVAGE SHIPS.—Ciclope (1903), 1,050 tons, 13·5 knots, 1 3-in. ; Titano (1913), 828 tons, 14 knots, 1 3-in.

NETHERLANDS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of Launch	Date of completion	Cost	Armour						Armament		Speed	Fuel		Com-ple-ment
											Belt	Deck	Side above belt	Bulk-head	Gun position: Heavy guns	Gun position: Secondary	Guns	Torpedo tubes		Coal	Oil	
		tons	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots	tons		
l.cr.	**Tromp**	3350	433	40¼	15	56,000	Amsterdam	1937	1938		2	1			10 H.N.S.	3 H.S.	6 *5·9-in.* in Tromp; 10 *4-in.* in Heemskerck, 4 *1·5-in.* A.A., 4 *·5-in.*, 1 seaplane.	6 *21-in.* T.)	32½	–	860	330
l.cr.	**Jacob van Heemskerck**	„	„	„	„	„	„	1939	1941 (in UK)		„	„							„			„

Minelayers.—Douwe Aukes (1922), 687 tons, 13 knots, 3 3-in. A.A., 2 M., 130 mines; Medusa (1911), 593 tons, 11·5 knots, 3 3-in., **1 M., 65 Mines; Willen van der Zaan, 1,350 tons, 15** knots, 2 4·7-in., 4 1·5-in., 4 M., 120 mines; Jan van Brakel (1936), 50 tons, 15 knots, 2 3-in., 1 1-pr., 4 M.

Minesweepers.—Jan van Gelder, Abraham Crijnssen (1937), 525 tons, 15 knots, 1 3-in., 4 M. A number of minesweeping trawlers.

Surveying Vessel.—Hydrograf (1911), 260 tons, 9 knots. Supply Ship.—Zuiderkruis (1923), 2,600 tons, **12½ knots.**

Submarine Depot Ship.—Cornelius Drebbel (1915), 688 tons, 170 H.P. (Diesel), 6 knots, 1 1·5-in.

Sloops.—Van Kinsbergen (1939), 1,760 tons, 25 knots, 4 4·7-in. guns; Flores, Soemba (1927), 1,500 tons, 14½ knots, 3 5·9-in., 6 M.

Gunboats.—Tyr (1878), 244 tons, 7 knots, 1 4·7-in., 2 1·5-in. A.A., Gruno, 530 tons (1915), 4 4·1-in., 2 M., 14 knots.

Motor Torpedo Boats.—*ex*-British. Number unknown. Patrol Vessel.—Queen Wilhelmina (1942) (*ex*-U.S.S. P.C., **468), 280 tons, 25 knots, 1 3-in.**

Motor Minesweepers.—17 in number (*ex*-British). Frigate.—Johan Maurits (*ex*-H.M.S. Ribble).

Hospital Ships.—Oranje, Tjitjalengka, Ophir, Tasman, Maetsuycker, Melchior Treve.

Training Ships.—Christian Cornelis, Van Speijk, Schorpiden, Buffel, Noord-Brabant.

Netherlands.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel
			Length (extreme)	Beam	Draught								Coal/Oil
DESTROYERS—			Feet	Feet	Feet		Tons		Knots				Tons
Jan van Galen (*ex*-H.M.S. Noble)	Denny Bros.	1941	356	35¾		2	1760	40,000	36	6 4·7-in., 1 4-in., 1 M. P.P.	5 21-in.		—/485
Tjerk Hiddes (*ex*-H.M.S. Nonpareil)	,,	,,	,,	,,		,,	,,	,,	,,	6 4·7-in., 1 M. P.P.	10 21-in.		,,
Piet Hien (*ex*-H.M.S. Serapis)	Scotts	1943	363	35¾		2	1700	40,000	36	4 4·7-in., several small A.A.	8 2-in. (Q.)		
Kortenaer (*ex*-H.M.S. Scorpion)	Cammell Laird	1942	,,	,,		2	,,	,,	,,	,,	,,		
Evertsen (*ex*-H.M.S. Scourge)		,,	,,	,,		,,	,,	,,	,,	,,	,,		
— (*ex*-H.M.S. Quilliam)		1941	,,	,,		,,	,,	,,	,,	,,	,,		
1ST CLASS TORPEDO BOAT—													
G16	Fijenoord	1914	162·5	17·3	9·0	1	150	2600	25	2 3-in.	3 17·7-in.	27	40/—
CORVETTE—													
Johan Mauritz (*ex*-H.M.S. Ribble)	Simons, Renfrew	1943	300				1450	5500 (R.)	20	2 4-in. HA/LA			
							Surf./Sub.						
SUBMARINES—													
Zwaardvisch *ex*-H.M.S. Talent	Vickers	1943	265	27·5	12	2	1090/1575	2500/1450	15¼/9	1 4-in.	6	53	
Tijgerhaai (*ex*-H.M.S. Tarn)	,,	1944	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	
Dolfijn *ex*-H.M.S. P.47	Vickers	1942	180	16·1	12·9	2	540/730	615/825	11½/10	1 3-in.	4	27	
Zeehond, *ex*-H.M.S. Sturgeon	Chatham	1932	203	24	10·5	2	670/960	1550/1300	13¾/10	1 3-in.	6	40	
K XIV	Rotterdam	1932–33	242	21·5	12·5	2	770/1030	3200/1000	17/9	1 3·5-in., 2 2-pr.	21-in.	35	
K XV	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	
O 19	,,	1938	265	24·6	12·5	2	966/1020	5000/—	17/	1 3·5-in., 2 1·5-in.	8 21-in.	36	
O 21	De Schelde	1939	254½	25½	13	2	888/1205	5000/—	20/9	1 3·5-in.	8 21-in.	37	
O 23	Rotterdam	1931	254½	25½	13	2	888/1205	5000/—	20/9	1 3·5-in.	8 21-in.	37	
O 24	,,	1924	,,	,,	,,	,,		,,		,,	,,	,,	
O 27	Wilton Fijenoord	1940	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	
O 15	De Schelde	1931	199	18·7	11·5	2	560/100	1900/600	15/8	2 1·5-in. A.A.	5 21-in.	31	
O 10	Amsterdam	1925	179½	18·7	11½	2	506/627	900/—	12¾/9	1 22-pr. A.A., 1 maxim.	5 21-in.	29	—/21
O 9	Flushing	,,	,,	,,	,,	,,	,,	,,	,,		,,	,,	,,

NORWAY.

Class	NAME	Normal Displacement	Length (extreme)	Beam	Draught	Horse-power	Where built	Date of launch	Date of completion	Cost	Armour						Armament		Speed	Fuel	Com-plement
											Belt	Deck	Side above belt	Bulkhead	Gun position		Guns	Torpedo tubes		Coal Oil	
															Heavy guns	Secondary					
		tons	ft.	ft.	ft.					£	in.	in.			in.	in.			knots	tons	
c.d.s.	**Harald Haarfagre**	3858	304	48½	17⅔	4500	Elswick	1896	1898	300,000	7 H.S.	2			8 H.S.		6 *4-in.*, several smaller A.A.	3 18-in.	16·5	550 —	249
c.d.s.	**Tordenskjold**	3858	304	48½	17⅔	4500	Elswick	1897	1899	300,000	7 H.S.	2			8 H.S.		,,	2 (sub.) 18-in.	16·5	550 —	249
c.d.s.	**Eidsvold**	4100	310	50½		4500	,,	1900	1903								2 *8·2-in.*, 6 *5·9-in.* 8 *3-in.*	2 18-in.	,,	,,	270

Patrol Vessels.—Nordkapp (1937), 273 tons, 13·7 knots, 1 1·85-in. ; Heimdal (1892), 660 tons, 12 knots, 4 12-pr. ; Vestfjord, Stathav, King Haakon VII (*ex*-U.S. P.C. 467), Seaja (1937).

Minelayers.—Laugen (1918), 335 tons, 9½ knots, 2 3-in. M., 50 mines ; old gunboats, refitted as minelayers : Tyr, Gor, Vidar, Brage, Nor, Vale, and Uller, 230–280 tons, armed with one 4·7-in. and other guns ; Olav Trygrason, minelayer and training ship, built at Horten, 1,747 tons, 21¾ knots, 6,000 H.P., 4 4·7-in. and 1 3-in. A.A. guns, and 2 T.T.S. (18-in.), 280 mines.

Minesweepers.—Rauma and Otra (1940), 360 tons, 13·5 knots, 1 1·5-in., 2 M. ; several Bangor Class, a number of *ex*-British and U.S. Motor Minesweepers.

Motor Torpedo Boats.—*Ex*-British, 9 in number. Motor Launches.—*Ex*-British, 3 in number.

Corvettes.—Eglantine, Acanthus, Buttercup (*ex*-British Flower Class), Tunsberg Castle (ex-British "Castle" Class).

Trawlers.—A number of British Isles Class.

Whalers.—A large number of miscellaneous craft.

Norway.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Maxi-mum trial speed	Armament	Torpedo tubes	Complement	Fuel Coal / Oil
			Length (extreme)	Beam	Draught								
Destroyers—			Feet	Feet	Feet		Tons		Knots				Tons
2 Destroyers	Horten	Bldg.	319	32·9	8·9	2	1220	30,000	34	4 4·7-in., 2 1·57-in.	4 21-in.	120	
Stord	J. S. White	1943	362¾	35¾	10	2	1710	40,000	36	4 4·7-in.	8 21-in. (Q.)		
Glaisdale	Cammell Laird	1942	280	31½	8	2	1050	19,000	29	4 4-in.			
Arundal	,,	1941	,,	,,	,,	,,	,,	,,	,,	6 4-in.			
Draug	Horten	1908–	226	23·5	8·8	2	540	7500	27·0	6 4·7-in.	3 18-in.	71	95/6
Torpedo Boats: *First Class—*													
Brand	Horten	1900	130·9	16·0	6·9	1	100	1100	21	2 M.	2 18-in.	19	17/—
Laks	,,	1900	126·4	15·0	6·9	1	100	1150	21·8	2 M.	2 18-in.	19	,,
Sleipner	,,	1936	236·3	25·5	6·9	2	625	12,500	30	3 4-in., 1 1·5-in. A.A.	2 21-in.	72	—/100
Gyller	,,	,,	,,	,,	,,	,,	,,	,,	,,				
Odin, Balder, Tor	Fredrikstad	1939	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Second Class—													
Kjek Hvas	Fredrikstad	1898	114·5	14·5	6·0	1	73	650–750	19–20	2 M.	2 18-in.	14	11/—
Hauk Falk	Horten	1903	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Teist	,,	1906–7	133	14·5	6·5	1	100	1600	25	2 3-pr.	,,	18	16/—
Lom		,,	117	14·5	5·7	1	72	1100	23	2 M.	,,	16	15/—
Orn	,,	1903	113	14·5	5·7	1	73	850	23	2 M.	,,	,,	,,
Submarines—													
B 1	Horten	1922	167·3	17·5	10·5	2	413/545	900/640	14·5/10	1 3-in.	4 18-in.	23	—/21
Four Submarines	*ex*-British Unity Class	1943	180	16·1	12·9	2	540/730	615/825	11¼/10	1 3-in.	4 21-in.	27	

SOVIET UNION.—BATTLESHIPS.

Class	NAME	Normal displacement	Length (extreme)	Beam	Draught	Horse-power	Where built	Makers of engines	Date of launch	Date of completion	Cost	Armour						Armament		Speed	Fuel	Com-plement
												Belt	Deck	Side above belt	Bulk-head	Gun position		Guns	Torpedo tubes		Coal Oil	
																Heavy guns	Secondary					
		tons	ft.	ft.	ft.						£	in.	in.	in.	in.	in.	in.			knots	tons	
b.	**Archangel** ‡	29,150	620¾	101½	29	40,000 Y.	Portsmouth D.Y.	Parsons	1915	1916	2,570,504	13–4	4–1	6	6–4	11	6	8 *15-in.*, 12 *6-in.*, many smaller.	"	"		
b.	**Parizhskaya Kommuna** (*ex*-Sevastopol) †	23,000	594	87	27½	42,000 P.T.	Baltic Works	Baltic Works	1911	1915		9–5	3			12–10	6	12 *12-in.*, 16 *4·7-in.*, 10 *3-in.* A.A., 8 M., *and smaller* 2 seaplanes.	4 (sub.) 18-in.	23	2000 1000	1125
b.	**Oktyabrskya Revolyutsiya** (*ex*-Gangut) ‖	23,000	594	87	27½																	
b.	**Marat** (*ex*-Petropavlovsk) *	23,606	594	87	31																	

† Modernised, 1937. ‖ Modernised, 1933. * Modernised 1931. ‡ Ex-H.M.S. Royal Sovereign, on loan to U.S.S.R.

SOVIET UNION.—CRUISERS.

Class	NAME	Normal displacement	Length (extreme)	Beam	Draught	Horse power	Where built	Date of launch	Date of completion	Cost	Armour		Armament		Speed	Fuel	Complement
											Belt Deck	Gun position	Guns	Torpedo tubes		Coal Oil	
		tons	ft.	ft.	ft.					£	in.	in.			knots	tons	
cr.	**Murmansk** *	7050	555½	55⅓	13½	90,000 P.T. (G.)	Philadelphia (Cramp)	1921	1923		3 1½		10 6-*in.*, 7 3-*in.*	6 21-*in.* (T.)	33	— 1800	—
m.cr.	**Marti**	3500	410						1936		2		4 *5·1-in.*, 3 *3-in.* A.A., 300 mines.		25		
cr.	**Krasni Kavkaz** (*ex*-Ad. Lazarev)	7600	535	51½	19	60,000	Nikolaev	1916	1930		3 1	3	4 *7·1-in.*, 4 *3-in.* A.A., 4 *4-in.* A.A., 4 M., 100 mines, 2 seaplanes.	12 *21-in.* (T.)	29½	540 690	650
cr.	**Krasny Krym** (*ex*-Profintern)	7200	520	50⅓	18½	55,000 P.T. (Y.)	Reval	1915	1925		3 1	3	15 *5·1-in.*, 4 *4-in.* A.A., 4 *3-in.*, 4 M., 2 aircraft, 100 mines.	12 *21-in.*	29½	540 690	630
cr.	**Kirov**	7725	613½	58	18	105,000	Leningrad	1936	1937		3 2		9 *7·1-in.*, 4 *4-in.*, 8 *1·5-in.* A.A., 2 aircraft.	6 *21-in.* (T.)	34		624
cr.	**Maxim Gorki**	,,	,,	,,	,,	,,		1937	1939						,,		
cr.	**Kuibishev**	,,	,,	,,	,,	,,		1939	1941						,,		
cr.	**Molotov**	,,	,,	,,	,,	,,		1936	1940				,,	,,	,,		
cr.	**Voroshilov**	,,	,,	,,	,,	,,		1936	1940				,,	,,	,,		

GUNBOATS.—Krazni Vostok, Sun Yat Sen, Lenin, Chicherin (1910), 950 tons, 11 knots, 1 6-in., 1 3-in.; Bednota, Krasnoe-Znamya, Rabochi, Proletarri, Krasni Buryat, Krasni Mongol, Krasni Moryak (1907), 11 knots, 190 tons, 2 4·7-in.; Krasni Azerbaidzhan, Lenin, No. 3 (1909), 640 tons, 12 knots, 2 4-in., 2 3-in.; Krasnaya Gruziya (1906), 1,100 tons, 9 knots, 2 5·1-in., fitted for minelaying; Altvater, Bakinsky Rabotchi, Markin (1905), 710 tons, 25 knots, 3 4-in., 2 M.; Krasnaya Zvezdo (1906), 1,300 tons; Krasnoe Znamya (1895), 1,500 tons, 5 5-in., 2 3-in.; Karjala (1918), *ex*-Finnish, 350 tons, 14 knots, 2 3-in.; Yrjo and Aunus (*ex*-Finnish); Presidentas Smetone, 380 tons, 2 3-in., 16 knots; Laine, 400 tons, 12 knots, 2 75 mm.; Mardus, 80 tons, 2 3-in.

MINELAYERS.—25 Oktyabrya (1873), 4,500 tons, 11 knots, 4 3-in., 600 mines; Suurop, Ristna (1905), 450 tons, 12 knots, 1 3-in.; Marti, 12 others.

MINESWEEPERS.—Mikula, Iskra, 500 tons, 1 3-in.; Zapal, Zmei, Kluz (1911), 180 tons, 11 knots, 1 3-in.; Djalita (1926), 359 tons, 10 knots, 2 3-in.; Dorotea (1924), 443 tons, 10 knots, 23-in.; Udarnick (1917), 185 tons, 10 knots, 1 3-in.; Nos. I–VI (1935), 400 tons, 16 knots, 1 4-in., 1 M.G.; Lahna and Kuore (1937), *ex*-Finnish, 16 tons, 10 knots; Fugas, Kapsul, Paravan, Podsekateo, Provodnik, Strela, Patron, Bui, Tcheka, Gafel, Tros, Verp, Zapal, Vzriv, Krambol (1933–40), 500 tons, 16 knots, 1 4-in., 1 1·7-in.; Keri, Vaindlo, 50 tons, 9 knots; Takhona, 45 tons, 12 knots. Many acquired from U.S. Navy and R.N.

OILERS.—Gornjak (1898), 1,576 tons, 12 knots; Zheleznodorozhnik, 2,000 tons, 10 knots; 13 others.

ICE-BREAKERS.—Josef Stalin, Kaganovitch, A Mikojan (1938–40), 11,000 tons, 15 knots, 3 seaplanes; Lenin, 5,700 tons, 19 knots; Krassin (1917), 10,000 tons, 15 knots; Sadko (1913), 1,616 tons, 14 knots; Maligin (1912), 1,535 tons; Sedov, Rusamov, Sibiryakov (1909), 1,140 tons, 12 knots; Truvor (1896), 1,450 tons, 13 knots; Davidov, 1,525 tons, 15 knots; Dobriniya Nikititch (1916), 1,664 tons; Feodort Litke (1909), 3,000 tons, 17 knots; V. Molotov (building); S. Makarov (1916), 4,000 tons, 14 knots; Yermak (1898), 8,000 tons, 14 knots; 30 others.

DEPOT SHIPS.—Krasni Gorn (1911), 1,892 tons, 11 knots; Serp-I-Molot (1900), 6,000 tons, 11 knots; Smolni, 3,200 tons, 10 knots; Kommuna (1913), 2,400 tons, 10 knots; Sovietskaya Rossiya, 5,200 tons, 12 knots; Oka (1914), 1,982 tons, 10 knots; Soviet, Antoni, Krasny Moryak and others.

TRAINING SHIPS.—Svir, 10,000 tons gross, 15 knots; Martinov, Osovaiakhim, Artemev, Kursant, Ucheba, Praktika (1907), 300 tons; Komsomolets (1902), 11,000 tons, 18 knots, 4 3-in.; Amur, 3,000 tons, 13 knots, 1 4·7-in.; Leningrad Soviet (1895), 1,300 tons, 10 knots.

GUARDSHIPS.—Razvedchik (1904), 100 tons, 16 knots, 2 3-pr.; Dzerzhinski, Kirov (1934), 800 tons, 21 knots, 2 4-in., 4 1·5-in. A.A.; Five vessels, 200 tons, 16 knots, 1 4·7-in.; Eight vessels, 350 tons, 20 knots, 1 4·7-in.

MOTOR-TORPEDO BOATS.—A large number of *ex*-U.S. PT. Boats.

WATERTANKERS.—Vodolei I and II, 660 tons, 9½ knots, 3 others.

SURVEYING VESSELS.—Hidrografs (*ex*-Latvian), Okean, Okhotsh, Astronom, Zenit, Azimut and 24 others.

PATROL VESSELS.—Khorek, Kunitsa, Laska, Vidra (1936–37), 180 tons, 12 knots, 2 3-in.; 40 others.

6 HOSPITAL SHIPS.

FISHERY PROTECTION VESSELS.—Alvin, Gorislava.

5 SALVAGE VESSELS.

SUBMARINE CHASERS.—Many acquired from U.S.N.

*** *Ex*-U.S.S. Milwaukee, on loan from U.S. Navy.**

SOVIET UNION.—FLOTILLAS.

Some of the details given below are uncertain.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	De-signed speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
Flotilla Leaders—			Feet	Feet	Feet		Tons		Knots				Tons
Leningrad	Leningrad	1935	460	45	14	2	2950	90,000	36	5 5·1-in., 2 3-in. A.A.	21-in.		
Minsk	,,	1936	,,				,,				,,		
Ordzhonikidze	Vladivostok	1936	,,				,,			,,	,,		
Baku and several others	,,	1937	,,				,,			,,	,,		
Destroyers—													
Boiki		1938–1940				2	1600	50,000	38	4 5·1 in., 2 1·5 A.A.	6 21-in.		
Gromki						,,	,,	,,	,,				
Grozni		,,				,,	,,	,,	,,	,,	,,		
Gremyashchi		,,				,,	,,	,,	,,	,,	,,		
Grozyashchi and many others		,,				,,	,,	,,	,,	,,	,,		
Karl Liebknecht	Leningrad	1914	321	31	9·25	2	1610	32,000	29	4 4-in., 1 3-in. A.A., 2 M., 80 mines.	9 18-in. (T.)	110	400
Uritsky	,,	1914	321	,,	,,	,,	,,	,,	,,			,,	,,
Stalin	,,	1914–15	315	31	10	2	1260	30,000	28				
Voikov	,,		,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Shtorm	Nikolaev	1932	236	24	10	2	700	13,200	29	2 4-in., 3 3-in., 2 M., 40 mines	9 18-in.	72	
Shkval	,,	,,	,,	,,	,,	,,	,,	,,	,,			,,	
Groza	Leningrad	1933–35	236	24	10	2	700	13,200	29	2 4-in., 3 3-in., 2 M., 40 mines	9 18-in.	72	
Metali	,,		,,	,,	,,	,,	,,	,,	,,			,,	
Smertsch	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	
Uragan	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	
Vyuga	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	
Grom	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	
Vikhr	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	
Tucha	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	
Molniya	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	
Zarnitza	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	
Guard Ships—													
Dserschinski	Ansaldo	1934	250	27	9	3	800	5400	20	2 4-in., 4 1·5-in.	,,	120	44
Kirov	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
							$\frac{\text{Surf.}}{\text{Sub.}}$		$\frac{\text{Surf.}}{\text{Sub.}}$				
Submarines—													
Chartist		1930–33					$\frac{1039}{1335}$			1 4-in., 1 M.G.	6 21-in.		
Garibaldiets		,,					,,				,,		
Karbonari		,,					,,			,,	,,		
Dekabrist		1931	240	23	13¾	2	$\frac{869}{1318}$	$\frac{2500}{1200}$	$\frac{15}{8}$	1 4-in., 1 1·5-in., 1 M.	8 21-in.	44	78
Narodovoleets		,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Krasnogvardeets		,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Komsomolka		,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Jacobinets		,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Revolusioner		,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Spartakovets		,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
12 others		1936	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
About 100 Type M		1935–41	150				$\frac{200}{—}$		$\frac{13}{8}$	1 1·5-in.	2 18-in.		
About 100 Type Schtsch		,,	200				$\frac{500}{—}$			1 1·5-in.	6 21-in.		
About 20 Type "S"		1938–40								1 3-in.	6 21-in.		

A number of British Town Class destroyers have been transferred to U.S.S.R.
A number of old Torpedo Boats are used as guard ships.

Soviet Union—*continued.*

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Designed speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
			Feet	Feet	Feet		Tons $\frac{\text{Surf.}}{\text{Sub.}}$		Knots $\frac{\text{Surf.}}{\text{Sub.}}$				Tons
SUBMARINES—*contd.*													
About 20 Pravda and improved Pravda Classes		1936–40					$\frac{1200}{1800}$			2 4-in., 2 M.	8 21-in.		
Komissar	St. Petersburg	1916–17	223	14¾	12·6	2	$\frac{650}{790}$	$\frac{2600}{900}$	$\frac{16}{9}$	2 6-pr., 1 M.G.	4 18-in.	33	40
Kommunar	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Tovarisnch	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Krasnoarmeets	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Krasnoflotets	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Bednyak	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Proletarii	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Batrak	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Rabochi	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Aktivist	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Politruk	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Internationalist	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Partizan	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
About 25 Type " C "	,,	1930–35								1 4-in.			
L55 (*ex*-British)	,,	1917	230	24	13	2	$\frac{870}{1139}$	$\frac{2400}{1600}$	$\frac{17}{10}$	1 4-in., 1 M.G.	6 21-in.	28	78
*Lembit	Vickers	1937	190	24½	11	2	$\frac{620}{820}$	$\frac{1200}{700}$	$\frac{13½}{8½}$	1 1·57-in., 20 mines.	4 21-in.	40	
4 in No.	*ex*-British	1936–40				2							

* *ex*-Estonian.

SPAIN.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour		Armament		Speed	Fuel	Complement
											Side / Deck	Gun position	Guns	Torpedo-tubes		Coal / Oil	
		tons	ft.	ft.	ft.					£	in.	in.			knots	tons	
cr.	**Canarias**	10,000	636	64	17·4	90,000 P.T. (G.) Y.	Ferrol	1931	1934		4 / 3	1	8 *8-in.*, 8 *4·7-in.* A.A., 8 *2-pr.* A.A., 2 seaplanes; 1 catapult.	12 21-in. (T.)	33·0	— / 2750	765
cr.	**Miguel de Cervantes**	7475	579½	54	16½	80,000 P.T. (G.) Y.	Ferrol	1928	1930		3 / 1		8 *6-in.*, 4 *4-in.* A.A., 2 *3-pr.*, 1 M.	12 21-in. (T.)	33·0	— / 1680	560
cr.	**Almirante Cervera**							1925	1928								
cr.	**Galicia**, *ex*-**Libertad** (*ex*-Principe Alfonso)							1925	1927								
cr.	*__Navarra__, *ex*-**Republica** (*ex*-Reina Victoria Eugenia)	4857	462	50	15¾	25,500 P.T.	Ferrol	1920	1923		3–1½ / 1½	3	4 *3·5-in.* A.A., 4 M., 1 L.		25·5	1200 / 230	404
cr.	**Mendez Nuñez**	4509	462	46	14½	45,000 (G.)	Ferrol	1922	1924		3 / 1		6 *6-in.*, 4 *1·9-in.* A.A., 4 M.	6 21-in. (T.)	29	800 / 500	320
g.b.	**Dato**	1314	251½	33½	11½	1700 (T)	Ferrol	1923	1925				4 *4-in.*, 2 *1·9-in.* A.A., 2 M.		15	324 / —	220
g.b.	**Canalejas**	”	”	”	”		”	1922	1924						”		”
g.b.	**Canovas Del Castillo**	”	”	”	”	”	”	1922	1923				”		”		”
g.b.	**Calvo Sotelo**	1600	282	39½	11	6500 (T)	Cadiz	1934	1938				4 *4·7-in.*, 4 *·5-in.* A.A. M.		20	”	140
g.b.	**Herman Cortes**					5000 (D)		Bldg.					6 *4-in.*, 8 *1·5-in.* A.A., 6 *·8-in.* A.A.		20		
g.b.	**Pizarro**							”							”		
g.b.	**Vasco Nunez de Balbao**					”		”					”		”		
g.b.	**Martin Alonso Pinzon**					”		”					”		”		
g.b.	**Magallanes**					”		”					”		”		
g.b.	**Vincente Yanez Pinzon**					”		”					”		”		
g.b.	**Sarmiento de Galboa**					”		”					”		”		
	Legaspi					”		”					”		”		

* Training ship

SAILING TRAINING SHIPS.—Juan Sebastian de Elcano (1928), 3,500 tons, 800 H.P. (Diesel), 9·5 knots, 4 2·4-in.; Galatea (*ex*-Clarastella) (1903), 2,710 tons, 8½ knots, 4 2·24-in.

TRAINING SHIPS.—Virgen de La Caridad, Contramaestre Castello.

OILER.—Pluton, 7,000 tons, 13 knots. Two building. SURVEY VESSELS.—Tofino, Malaspina, 1,200 tons, 12 knots, 2 4-in.; Artabro, Castor.

ARMED TRAWLERS.—Alcazar, Larache and Tetuan, 400 tons, 10 knots, 1 3-in. (also 2 3-pr. in Alcazar); Arcila, 510 tons, 10½ knots, 2 3-in.; Uad Martin, 420 tons, 10 knots, 1 3-in.; Uad Quert, Xauen, 650 tons, 10½ knots, 1 3-in.

FISHERY PROTECTION VESSELS.—8 in number, 150 tons, 11 knots, 1 6-pr. PATROL VESSELS.—1, 2, 4, and 6.

MINELAYERS.—Jupiter, Marte, Neptuno, Vulcano, 2,100 tons, 18½ knots, 4 4·7-in. A.A., 4 1·6-in. A.A., 4. M.G., 264 mines, 2 depth charge release gears; Eolo, Triton, 1,500 tons, 18·5 knots; 4 4-in., 4 1·5-in., 4 M.G., 100 mines. TRANSPORT.—Contramaestre Casado, 7,275 tons, 10½ knots, 4 1·6-in.

TUGS.—R.R.12 (*ex*-Cartagenero), Ferrolano, R.R.14 (*ex*-Gaditano), 300 tons, 10 knots, 1 6-pr.; R.R.11 (*ex*-Galicia), 350 tons, 10 knots, 1 3-in.; R.A.1 (*ex*-Ciclope), 800 tons, 12 knots; 1 3-in. R.P. 21–27. MOTOR TORPEDO BOATS.—Twenty in number. M.A.S. BOATS.—Fourteen in number.

MINESWEEPERS.—Bidasoa, Guadelete, Lerez, Nervion, Segura, Tambre, Ter, 615 tons, 16½ knots, 1 4-in., 2 ·37 mm., 2 20 mm.

Spain.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Maximum trial speed	Armament	Torpedo tubes	Complement	Fuel Coal / Oil
			Length (extreme)	Beam	Draught								
			Feet	Feet	Feet		Tons		Knots				Tons
DESTROYERS—													
Gravina	Cartagena	1931	333	31·7	10·5	2	1536	42,000	36	5 4-in., 1 3-in. A.A., 4 M. (some have 4 4·7-in.	6 21-in. (T.)	175	— / 540
Escano	,,	1932	,,	,,	,,	,,	,,	,,	,,				
Ciscar	,,	1933	,,	,,	,,	,,	,,	,,	,,			,,	,,
Jorge Juan	,,	,,	,,	,,	,,	,,	,,	,,	,,		,,	,,	,,
Ulloa	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Almirante Valdés	,,	1930	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Almirante Antequera	,,	,,	,,	,,	,,	,,	,,	,,	,,		,,	,,	,,
Almirante Miranda	,,	1931	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Churruca	,,	1929	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Alcala Galiano	,,	1930	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Lepanto	,,	1928	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
José Luis Diez	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Sanchez-Barcaiztegui	,,	1926	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Juan Lazaga	,,	1924	283	27	9	2	1044	33,000	34	3 4-in., 2 1·85-in. A.A.	2 21-in. (D.)	70	— / 265
Valeseo	,,	1923	,,	,,	,,	,,	,,	,,	,,				
Alsedo	,,	1922	,,	,,	,,	,,	,,	,,	,,	,,		,,	,,
Velasco Ceuta	Naples	1920	310	31	10	2	1706	60,000	34	4 4·7-in., 2 3-in., 2 M.	2 17·7-in. (D.)	139	— / 260
Velasco Melilla	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,		,,	
Huesca (*ex*-Italian)	Ansaldo	1915	170	26	8	2	850	20,000	32	5 4-in., 2 1·57-in. A.A., 2 M.	2 17·7-in. (D)	99	— / 250
Teruel (,,)	,,	,,	,,	,,	,,	,,	,,	,,	,,				
TORPEDO BOATS—													
T 7, 14, 17	Cartagena	1913–22	164	16·5	6⅓	3	187	3750	26	3 1·4-in.	3 18-in.	31	33 / —
							Surf. / Sub.		Surf. / Sub.				
SUBMARINES—													
D1, 2, 3	,,	1944	276	21·8	13	2	1050 / 1375	5000 / 1350	20·5 / 9·5	1 4·7-in., 4 M.	6 21-in.		
C 2, 4	,,	1928–29	247	20·8	13·5	2	900 / 1270	2000 / 750	16 / 8·5	1 3-in. A.A.	6 21-in.	40	200
Isaac Peral (*ex*-C 1)	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
B 2	,,	1921–24	210	18·9	11·25	2	560 / 830	1400 / 850	16 / 10·5	1 3-in. A.A.	4 18-in.	28	— / 66
General Mola (*ex*-Italian)	Taranto	1934	231·5	22·5	13	2	880 / 1230	3000 / 1300	17 / 8·5	2 3·9-in., 2 M.G.	8 21-in.	48	150
General Sanjurjo (*ex*-Italian)	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,

SWEDEN.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour						Armament		Speed	Fuel	Com-plement
											Belt	Deck	Side above belt	Bulk-head	Gun position		Guns	Torpedo tubes		Coal Oil	
															Heavy guns	Secondary					
		tons	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots	tons	
c.d.s.	Two in number	8000	436	64	10½			Blg.									4 *10-in.*, 6 *4·7-in.*, 8 *1·5-in.* A.A.		22		
l.cr.	**Tre Kroner**	7000	591			100,000	Gotaverken	Blg.									7 *6-in.*, 8 40- MM.	6 21-in.	33		590
	Gota Lejon	,,	,,			,,	Eriksberg	,,									,,		,,		,,
l.cr.	**Fylgia**	4200	378	48·6	20·6	12,444 Y. *t*	Stockholm	1905	1907	385,700	4 K.S.	2			5 K.S.	5 K.S.	8 *5·9-in.*, 4 *2·2-in.*, 4 *1·5-in.*	2 21-in.	22·7	900 —	328
l.cr.	**Gotland** †	4700	442	50·6	14·7	39,000 (G.)	Gothenburg	1933	1934	910,000 (estimated)							6 *6-in.*, 4 *3-in.* A.A., 4 M., 100 mines	6 21-in. (T.)	27·0	oil	453
c.d.s.	**Drottning-Victoria** *	7100	396·7	61	21½	22,000 (G.) Y.	Gothenburg	1917	1921	666,000	8–6 K.S.	1½	4 H.S.		8 K.S.	5 K.S.	4 *11-in.*, 8 *5·9-in.*, 4 *3-in.*, 2 *6-pr.*, 6 M.	—	23·0	690 98	450
c.d.s.	**Gustav V** *	7100	396·7	61	21½	22,000 (G.) Y.	Malmö	1918	1922	666,000	8–6 K.S.	1½	4 H.S.		8 K.S.	5 K.S.	4 *11-in.*, 6 *5·9-in.*, 4 *3-in.* A.A., 2 *6-pr.*, 6 M.	—	23·0	690 98	450
c.d.s.	**Manligheten**	3361	287	49½	17·4	7400 Y.	Malmö	1903	1904		7 K.S.	1⅞			7½ K.S.	5 K.S.	2 *8·3-in.*, 6 *5·9-in.*, 8 *6-pr.*, 1 *1-pr.*	2 sub. 18-in.	17·0	300 —	300
c.d.s.	**Oscar II** *	4250	313·6	50·5	18	9000 Y.	Gothenburg	1905	1907	..	6 K.S.	2	6 K.S.	6 K.S.	7½ K.S.	5 K.S.	2 *8·3-in.*, 8 *5·9-in.*, 8 *6-pr.*, 1 *1-pr.*	2 sub. 18-in.	18·0	500 —	330

* Reconstructed and modernised (1939).

† Reconstruction as A.A. ship from a hangar cruiser.

SWEDEN—*continued.*

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour						Armament		Speed	Fuel	Complement
											Belt	Deck	Side above belt	Bulkhead	Gun position		Guns	Torpedo tubes		Coal Oil	
															Heavy guns	Secondary					
c.d.s.	**Sverige** *	tons 6899	ft. 392·7	ft. 61	ft. 21½	20,000 tur. Y.	Gothenburg	1915	1917	£ 660,000	in. 8–6 K.S.	in. 1½	in. 4 K.S.	in. ..	in. 8 K.S.	in. 5 K.S.	4 *11-in.*, 6 *5·9-in.*, 4 *3-in.*, 2 *6-pr.*, 6 M.	—	knots 22·5	tons 690 98	450
c.d.s.	**Tapperheten**	3361	287	49½	17·7	6000 (R) Y.	Malmö	1901	1903	..	7 K.S.	1⅝	..	..	7½ K.S.	5 K.S.	2 *8·3-in.*, 6 *5.9-in.*, 10 *6-pr.*, 1 *1-pr.*	2 sub. 21-in.	16·5	300 —	287
c.d.s.	**Aran**	„	„	„	„	„	Gothenburg	1901	1902		„	„			„	„	„	„	„	„	„

*** Reconstructed and modernised (1929–39)**

Minelayers.—Aelvsnabben, 3,750 tons, 4 6-in., 14 knots; Clas Fleming, 1,570 tons, 4 4·7-in., 4 M., 20 knots, 200 mines.

Depot Ships for Submarines.—Patricia (1926), 3,000 tons, 14 knots.

Icebreakers.—Atle, 1,720 tons, 16 knots, 2 2·2-in.; Ymer, 3,450 tons, 18 knots, 4 3-in. Three building.

Aircraft Depot Ship.—Dristigheten (1901), 3,218 tons, 16 knots, 4 3-in., 3 aircraft.

Depot Ships.—Jacob Bagge, Örnen, 738 tons, 20 knots, 2 4·7-in., 2 2·2-in.

Sailing Training Ships.—Af. Chapman (1888), Jarramas (1900), 350 tons.

Vedette Boats (used for minelaying and minesweeping).—Kaparen, Jagaren, Snapphanen, Vaktaren, 290 tons, 24 knots, 2 3-in., 2 1-in. A.A.; Altair, Argo, Astrea, Antares, Iris, Perseus, Polaris, Regulus, Rigel, Spica, Thetis (1908–11), 105 tons, 25 knots, 2 2·2-in., 1 18-in. T.T.; Castor, Pollux (1909), 105 tons, 20 knots, 2 1·5-in., 1 18-in. T.T.; No. 19 (1914), 55 tons, 10 knots; Nos. 27, 28, 30, 33, 34, 35, 36 (1900), 50 tons, 17 knots, 2 1·5-in., 1 15-in. T.T. Nos. 5–9 (1907), 50 tons, 11 knots, 1 1·5-in., 2 18-in. T.T.

Salvage Vessel.—Belos. Tenders.—Sokaren, Sveparen, Sprangaren, 160 tons, 10 knots, 1 6-pr.

Motor Torpedo Boats.—Nos. 3 and 4, 55 ft., 25 tons, 2,200 H.P., 41 knots, 1 M., 2 18-in. T.T.; T 11, 12, 13, 14 (*ex*-Italian), 20 tons, 47 knots, 2 T.T.; T 15–18 (1941), 34 tons, 2 T.T., 18-in. T 19–22, 34 tons, several others.

Minesweepers.—Starkodder, Styrbjorn, 350 tons, 15 knots, 2 1·5-in.; M. 1 and 2, 60 tons, 16½ knots, 2 M.G.; Bremon, Holmon, Gronskar, Koster, Kullen, Ramskar, Sandon, Bredskar, Orskar, Ven, Vinga, Ulvon (1941), 17 knots, 2 4·3-in., 1 1-in. A.A.; Arholma, Lansort (1939), 365 tons, 17½ knots, 2 4-in.

Surveying Vessels.—Gustaf Af Flint, Kompass, Johan Nordenanckar, Peter Gedda, Ejdern, Falken, Svalan.

Oilers.—Brannaren (1933), 1,082 tons, 10 knots; Oljaren and Eldaren, 9 knots, 2 1-in.

Hospital Ship.—Prins Carl, 1,400 tons, 12 knots.

Sweden.

Name or number	Where built	Launched	Dimensions			Number of screws	Displacement	Horse-power	Maximum trial speed	Armament	Torpedo tubes	Complement	Fuel Coal / Oil
			Length (extreme)	Beam	Draught								
DESTROYERS—			Feet	Feet	Feet		Tons		Knots				Tons
Mode ‡	Gothenburg	1942	243	26·4	9·5	2	635			3 4-in.	3 21-in.		
Magne ‡	″	″	″	″	″	″	″			″			
Munin ‡	″	″	″	″	″	″	″			″	″		
Mjolner ‡	″	″	″	″	″	″	″			″	″		
Gavle	″	1940	304	29·5	12·5	2	1020	32,000	39	3 4·7-in., 4 1-in.	6 21-in.	131	— / 150
Norrkoping	″	″	″	″	″	″	″	″	″	″			
Karlskrona	Karlskrona	1939	″	″	″	″	″	″	″	″	″	″	″
Stockholm	″	1936	″	″	″	″	″	″	″	″	″		
Malmo	Goteborg	1938	″	″	″	″	″	″	″	″	″	″	″
Goteborg	″	1935	″	″	″	″	″	″	″	″	″	″	″
Klas Horn	Malmo	1931	304·2	29·2	10·5	2	1000	24,000	35	3 4·7-in., 2 2-pr. A.A., 2 M.	6 21-in. (T)	125	— / 150
Ehrensköld	Göteborg	1926	″	″	″	″	″	″	″			″	
Nordenskjold	Malmö	″	″	″	″	″	″	″	″	″	″	″	″
Ragnar ‡	Malmö	1909	216	20·8	9	2	354	8000–9000	30·0	4 3-in. 2 M.	2 18-in. (D.)	67	80 / 3
Sigurd ‡	Gothenburg	″	″	″	″	″	″		″	″		″	
Vidar ‡	Malmö	″	″	″	″	″	″	″	″	″		″	″
Hugin ‡	Gothenburg	″	″	″	″	″	″	″	″	″	″	″	″
Wrangel ‡	″	1917	232·8	22	9·2	2	458	11,000	34·0	4 3-in., 2 M.	6 18-in.	72	107 / 6
Wachtmeister ‡	″	″	″	″	″	″	″	″	″	″		″	
†Puke (*ex*-Ricasoli)	Naples	1926	278·6	28·2	8·7	2	935	36,000	35	4 4·7-in., 2 1·5-in. A.A., 2 M., 40 mines.	4 21-in.	106	— / 200
†Psilander (*ex*-Nicotera)	″	″	″	″	″	″	″	″	″			″	
†Romulus (*ex*-Spica)	″	1934	263·6	26·9	7·4	2	638	19,000	34	3 3·9-in., 6 1·5-in. A.A.	4 17·7-in.		
†Remus (*ex*-Astore)	″	″	″	″	″	″	″	″	″	″	″		
Sundsvall	Eriksberg	1943	320	29·5	9	2	1135	36,000	39	3 4·7-in., 6 40 MM.	6 21-in. (T)	140	
Kalmar	″	″	″	″	″	″	″	″	″	″		″	
Visby	Gotaverken	″	″	″	″	″	″	″	″	″		″	
Halsingborg	″	″	″	″	″	″	″	″	″	″	″	″	
SUBMARINES—							Surf. / Sub.		Surf. / Sub.				
1st Class—													
Dykaren	Kockum	1941	204	20·5	11	2	530 / 760	2000 / —	15 / 10	1 4-in., 2 M.	6 21-in.		
Sjoborren	″	″	″	″	″	″				″			
Sjohasten	″	″	″	″	″	″	″	″	″	″	″		
Sjoormen	″	″	″	″	″	″	″	″	″	″	″		
Svardfisken	″	″	″	″	″	″	″	″	″	″	″		
Tumlaren	″	″	″	″	″	″	″	″	″	″	″		
Draken	Naval Yard, Karlskrona	1926	213	21	10·8		700 / 850	2800 / —	16 / 9	1 4-in., 1 M.	4 20-in.	32	— / 40
Gripen	″	1928	″	″	″		″	″	″	″	″		
Valen ‡	″	1925	186	23·2	9·4		492 / 650		15 / 9	1 3-in., 1 M.	4 18-in.	″	— / 34
Nordkaparen	Kockum	1935	199	20⅔	11	2	500 / 720		15 / 10	1 4-in.	4 21-in.		
Delfinen	″	″	″	″	″	″				″		28	
Springaren	″	″	″	″	″	″	″	″	″	″	″	″	
Sjolejonet	″	″	″	″	″	″	″	″	″	″	″	″	
Sjobjornen	″	1936–42	204	20½	11	2	620 / —		15 / 10	1 4-in., 2 M.G.	4 21-in.	″	
Sjohunden	″		″	″	″	″				″		32	
Nackan	″	″	″	″	″	″	″	″	″	″	″	″	
Najad	″	″	″	″	″	″	″	″	″	″	″	″	
Neptun	″	″	″	″	″	″	″	″	″	″	″	″	
U1, U2, U4–9	″	1941–44	164	14		″	367 / —			1 20 MM.	4 21-in.	″ 25	
U3	Karlskrona	1942	″	″		″	″				″	″	

† *Ex*-Italian.

‡ Fitted for minelaying.

UNITED STATES.—BATTLESHIPS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost ‡	Armour						Armament		Speed	Fuel Oil	Complement
											Belt	Deck	Side above belt	Bulkhead	Gun position		Guns	Torpedo tubes			
															Heavy guns	Secondary					
		tons	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots	tons	
b.	**Kentucky**	45,000	887½	108	36	200,000 C.T.(G.)	Norfolk N.Y.	Blg.		100,000,000							9 *16-in.* guns, 20 *5-in.*, many smaller A.A. guns, 4 aircraft, 2 catapults.		30		2700
b.	**Iowa**	”	”	”	”		New York N.Y.	1942	1943	”									”		”
b.	**New Jersey**	”	”	”	”	”	Philadelphia N.Y.	1942	1943	”									”		”
b.	**Missouri**	”	”	”	”	”	New York N.Y.	1944	1944	”							”		”		”
b.	**Wisconsin**	”	”	”	”	”	Philadelphia N.Y.	1943	1944	”							”		”		”
	—																				
b.	**Washington**	35,000	729	108	28	115,000 tur.	Philadelphia N.Y.	1940	1941	17,500,000							9 *16-in.* guns, 20 *5-in.*, many smaller, 3 aircraft, 2 catapults. (S. Dakota has 16 *5-in.* guns.)		27		2500
b.	**North Carolina**	”	”	”	”	”	New York N.Y.	1940	1941	”									”		”
	—																				
b.	**Indiana**	”	680	108	29½	”	Newport News	1941	1942	”									”		”
b.	**Massachusetts**	”	”	”	”	”	Bethlehem (S.B. Co.)	1941	1942	”							”		”		”
b.	**Alabama**	”	”	”	”	”	Norfolk N.Y.	1942	1942	”							”		”		”
b.	**South Dakota**	”	”	”	”	”	New York (S.B. Co.)	1941	1942	”							”		”		”
	—																				
b.	**Arkansas** *	26,100	562	106	26	30,000 P. T.	New York (S.B. Co.)	1911	1912	964,000	11–5 K.S.	3		8–6 K.S.	11 K.S.	6½	12 *12-in.* (50 cal.), 6 *5-in.*, 8 *3-in.* (50 cal.) A.A., many smaller, 8 M., 1 catapult, 3 floatplanes.	—	20·5	5100	1650
b.	**California** †	32,600	624	97½	30½	26,800 tur. electric drive	Mare Island (Navy Yard)	1919	1921	2,620,000	14–8 K.S.	3		..	18 K.S.	..	12 *14-in.* (50 cal.), 16 *5-in.* (38 cal.), many small A.A., 2 catapults, 3 floatplanes.	—	21	4656	2200

* Modernised 1926.

† Rebuilt at Bremerton 1942–43.

‡ The sums given in this column are exclusive of the cost of armour and armament according to the system of making appropriations in the estimates

UNITED STATES.—BATTLESHIPS—*continued.*

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour						Armament		Speed	Fuel Oil	Complement
											Belt	Deck	Side above belt	Bulk-head	Gun position		Guns	Torpedo tubes			
															Heavy guns	Secondary					
		tons	ft.	ft.	ft.					£	in.	in.	in.	in.	in.	in.			knots	tons	
b.	**Colorado** ‡	32,600	624	97½	30½	27,300 B. & W. tur. electric drive	New York (S.B. Co.)	1921	1923	1,383,000	13½ K.S. –12				18 K.S.		8 *16-in.* (45 cal.), 12 *5-in.* (51 cal.), 8 *5-in.* (25 cal.) A.A., many small A.A., 2 catapults, 3 floatplanes.	2 (sub.) 21-in.	21·0	4570	2200
b.	**Idaho** ¶	33,400	624	106¼	29½	32,000 B. & W. P.T. (G.)	New York (S.B. Co.)	1917	1919	1,485,000	14 K.S.	3			18 K.S.		12 *14-in.* (50 cal.), 6 *5-in.* (51 cal.), 8 *5-in.* A.A., many small A.A., 2 catapults, 3 floatplanes.		21½	3271	1930
b.	**Maryland** ‡	31,500	624	97½	29⅔	27,300 B. & W. tur. (G.) and electric drive	Newport News	1920	1921	1,383,000	13½ –12 K.S.				18 K.S.		8 *16-in.* (45 cal.), 10 *5-in.* (51 cal.), 8 *5-in.* (38 cal.) A.A., many small A.A., 2 catapults, 3 floatplanes.		21	4570	2100
b.	**Mississippi** ¶	33,000	624	106¼	29¼	32,000 B. & W. C.T. (G.)	Newport News	1917	1917	1,485,000	14 K.S.	3			18 K.S.		12 *14-in.* (50 cal.), 6 *5-in.* (51 cal.), 8 *5-in.* A.A., many small A.A., 2 catapults, 3 floatplanes.		21	3271	1930
b.	**Nevada** §	29,000	583	108	27½	25,000 Y. P. tur.	Quincy, Mass. (Fore River)	1914	1916	1,211,342	13½–8 K.S.	1½–3		13½ K.S.	18–16 K.S.		10 *14-in.* (45 cal.), 16 *5-in.* (38 cal.) A.A., many small A.A., 2 catapults, 3 floatplanes.	—	20·5	2000	2100
b.	**New Mexico** ¶	33,400	624	106¼	29½	32,000 T.(G.)	New York (Navy Yard)	1917	1918	1,485,000	14 K.S.	3			18 K.S.		12 *14-in.* (50 cal.), 6 *5-in.* (51 cal.), 8 *5-in.* A.A., 2 *6-pr.*, many small A.A., 3 floatplanes.	—	21	3271	1930

b.	**New York** *	27,000	573	106	26	28,100 B. & W. recip.	New York (Navy Yard)	1912	1914	1,315,114	12–4 K.S.	3	9 K.S.	10 K.S.	14–8 K.S.	6 K.S.	10 *14-in.* (45 cal.), 6 *5-in.* (51 cal.), 8 *3-in.* (50 cal.) A.A., many small A.A., 1 catapult, 2 floatplanes.	—	21 0	5200	1530
b.	**Pennsylvania** †	33,100	608	106½	28	40,000 B. & W. Cur. tur.	Newport News	1915	1916	1,485,000	14 K.S.	3			18 K.S.		12 *14-in.* (45 cal.), 16 *5-in.* (38 cal.), A.A., many small A.A., 2 catapults, 3 floatplanes.	—	21·0	2300	2290
b.	**Tennessee** ‖	32,300	624	97½	30¼	34,800 B. & W. Tur. electric drive	New York (Navy Yard)	1919	1920	2,620,000	14–8 K.S.	3			18 K.S.		12 *14-in.* (50 cal.), 16 *5-in.* (38 cal.), many small A.A., 2 catapults, 3 floatplanes.	—	21·0	4656	
b.	**Texas** *	27,000	573	106	26	28,100 recip.	Newport News	1912	1914	1,166,000	12–4 K.S.	3	9 K.S.	10 K.S.	14–8 K.S.	6 K.S.	10 *14-in.* (45 cal.), 6 *5-in.* (51 cal.), 8 *3-in.* (50 cal.) A.A., many small A.A., 1 catapult, 3 floatplanes.	—	21·0	5200	1530
b.	**West Virginia** ‡	31,800	624	97½	30	27,300 B. & W. tur. electric drive	Newport News	1921	1923	1,383,000	13½–1 K.S.				18 K.S.		8 *16-in.* (45 cal.), 16 *5-in.* (58 cal.), A.A., many small A.A., 2 catapults, 3 floatplanes.	—	21·0	4570	2350
b.c.	**Alaska**	27,500	808½	89½		150,000 B. & W. T.(G.)	New York (S.B. Co.)	1943	1944								9 *12-in.* (50 cal.) 12 *5-in.* (38 cal.) 4 Aircraft 2 Catapults		30		1500
b.c.	**Guam**	„	„	„				1943	1944										„		„
b.c.	**Hawaii**	„	„	„			„	1945	Blg.										„		„

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* Modernised in 1927. Modernisation included fitting of bulge protection, protection of decks against aerial attack, conversion to oil burning, and addition of catapults.

† Modernised in 1931. Modernisation included fitting bulges, reboilering, increasing elevation of turret guns, replacing former anti-aircraft batteries by 5-inch A.A. guns, new masts and new fire control. Again overhauled in 1942.

‡ Bulged: West Virginia was completely rebuilt at Puget Sound 1943–4.

§ Modernisation in 1929. Alterations include fitting of bulges, deck protection, tripod masts, increasing elevation of turret guns, fitting a new 5-in. anti-aircraft battery.

‖ Rebuilt at Bremerton 1942–3.

¶ Rebuilt 1930–34: protection increased, bulges fitted, new turbines fitted (New Mexico originally had electric drive).

UNITED STATES.—AIRCRAFT CARRIERS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour		Armament		Speed	Fuel Oil	Complement
											Deck	Belt	Guns	Torpedo tubes			
		tons	ft.	ft.	ft.					£	in.	in.			knots	tons	
	Midway Class—																
a.c.	**Midway**	45,000	986	113		200,000	Newport News	1945	1945				18 *5-in.* (54 cal.), operates approx. 100 aircraft.		33		4000
a.c.	**Franklin D. Roosevelt**	”	”	”		”	New York N.Y.	1945	1945						”		”
a.c.	**Coral Sea**	”	”	”		”	Newport News	1945	1946				”		”		”
	Essex Class—																
a.c.	**Essex**	27,100	888	93		150,000	Newport News	1942	1943				12 *5-in.* (38 cal.), operates approx. 80 aircraft.		30		2500
a.c.	**Yorktown**	”	”	”		”	”	1943	1943						”		”
a.c.	**Intrepid**	”	”	”		”	”	”	”				”		”		”
a.c.	**Franklin**	”	”	”		”	”	”	1944				”		”		”
a.c.	**Hornet**	”	”	”		”	”	”	1943				”		”		”
a.c.	**Ticonderoga**	”	”	”		”	”	1944	1944				”		”		”
a.c.	**Randolph**	”	”	”		”	”	”	”				”		”		”
a.c.	**Boxer**	”	”	”		”	”	”	1945				”		”		”
a.c.	**Leyte**	”	”	”		”	”	1945	”				”		”		”
a.c.	**Lexington**	”	”	”		”	Bethlehem	1942	1943				”		”		”
a.c.	**Bunker Hill**	”	”	”		”	”	”	”				”		”		”
a.c.	**Wasp**	”	”	”		”	”	1943	”				”		”		”
a.c.	**Hancock**	”	”	”		”	”	1944	1944				”		”		”
a.c.	**Bennington**	”	”	”		”	New York N.Y.	”	”				”		”		”
a.c.	**Kearsarge**	”	”	”		”		1945	1945				”		”		”
a.c.	**Criskant**	”	”	”		”	”	1945	1946				”		”		”
a.c.	**Bon Homme Richard**	”	”	”		”	”	1944	1945				”		”		”
a.c.	**Shangri-la**	”	”	”		”	Norfolk N.Y.	”	1944				”		”		”
a.c.	**Tarawa**	”	”	”		”	”	1945	1946				”		”		”
a.c.	**Lake Champlain**	”	”	”		”	”	1944	1945				”		”		”
a.c.	**Antietam**	”	”	”		”	Philadelphia N.Y.	1944	1945				”		”		”
a.c.	**Princeton**	”	”	”		”	”	1945	1945				”		”		”
a.c.	**Valley Forge**	”	”	”		”	”	1945	1946				”		”		”
c.a.	**Philippine Sea**	”	”	”		”	Bethlehem	1945	1945				”		”		”

a.c.	**Enterprise**	19,900	809½	83¼	21¾	120,000 T. (G.) B. & W.	Newport News	1936	1938				8 *5-in.*, many light A.A., 80 aircraft, 1 catapult.		34		2200
	—																
a.c.	**Ranger**	14,500	769	80	19⅔	53,500 T. (G.)	Newport News	1933	1934	4,000,000	1		8 *5-in.*, many light A.A., 80 aircraft.		29¼		2000
	—																
a.c.	**Saratoga**	33,000	909½	105½	31	180,000 tur. electric (W.F.)	New York S.B. Co.	1925	1927	app. 9,000,000	3		16 *5-in.* (38 cal.), many light A.A., 80 aircraft, 1 catapult.		34		2500
	—																
	Independence Class *—																
l.a.c.	**Independence**	11,000	610	71½		100,000	New York S.B. Co.	1942	1943				Many light A.A. guns, approx. 45 aircraft.		33		1400
l.a.c.	**Belleau Wood**	”	”	”		”		”	”						”		”
l.a.c.	**Cowpens**	”	”	”		”	”	1943	”				”		”		”
l.a.c.	**Monterey**	”	”	”		”	”	”	”				”		”		”
l.a.c.	**Cabot**	”	”	”		”	”	”	”				”		”		”
l.a.c.	**Langley**	”	”	”		”	”	”	”				”		”		”
l.a.c.	**Bataan**	”	”	”		”	”	”	”				”		”		”
l.a.c.	**San Jacinto**	”	”	”		”	”	”	”				”		”		”
	—																
	Saipan Class—																
l.a.c.	**Saipan**	14,500	683½	76¾		120,000	New York S.B. Co.	1945	1945						30		
l.a.c.	**Wright**	”	”	”		”		”	1946						”		
	—																
	Casablanca Class—																
e.c.	**Casablanca**	6,730	498¾	65		11,200 (R.)	Kaiser Co.	1943	1943				1 *5-in.* (38 cal.), operates approx. 21 aircraft, 1 catapult.		18		800
e.c.	**Anzio**	”	”	”			”	”	”						”		”
e.c.	**Corregidor**	”	”	”		”	”	”	”						”		”
e.c.	**Mission Bay**	”	”	”		”	”	”	”						”		”
e.c.	**Guadalcanal**	”	”	”		”	”	”	”				”		”		”
e.c.	**Manila Bay**	”	”	”		”	”	”	”				”		”		”
e.c.	**Nantoma Bay**	”	”	”		”	”	”	”				”		”		”
e.c.	**Tripoli**	”	”	”		”	”	”	”				”		”		”
e.c.	**Wake Island**	”	”	”		”	”	”	”				”		”		”
e.c.	**White Plains**	”	”	”		”	”	”	”				”		”		”
e.c.	**Solomons**	”	”	”		”	”	”	”				”		”		”
e.c.	**Kalinin Bay**	”	”	”		”	”	”	”				”		”		”
e.c.	**Kassan Bay**	”	”	”		”	”	”	”				”		”		”
e.c.	**Fanshaw Bay**	”	”	”		”	”	”	”				”		”		”
e.c.	**Kitkun Bay**	”	”	”		”	”	”	1944				”		”		”
e.c.	**Tulagi**	”	”	”		”	”	”	”				”		”		”
e.a.	**Nehenta Bay**	”	”	”		”	”	”	”				”		”		”
e.c.	**Hoggat Bay**	”	”	”		”	”	”	”				”		”		”
e.c.	**Kabashan Bay**	”	”	”		”	”	”	”				”		”		”
e.c.	**Marcus Island**	”	”	”		”	”	”	”				”		”		”

* **Originally designed as cruisers.**

UNITED STATES.—AIRCRAFT CARRIERS—*continued.*

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost	Armour		Armament		Speed	Fuel Oil	Complement
											Deck	Belt	Guns	Torpedo tubes			
	Casablanca Class (*contd.*)	tons	ft.	ft.	ft.					£	in.	in.			knots	tons	
e.c.	**Savo Island**	6,730	498¾	65		11,200	Kaiser Co.	1943	1944				1 *5-in.* (38 cal.), operates approx. 21 aircraft, 1 catapult.		18		800
e.c.	**Petrof Bay**	”	”	”		(R.)	”	1944	1944						”		”
e.c.	**Rudyerd Bay**	”	”	”		”	”	”	”						”		”
e.c.	**Saginaw Bay**	”	”	”		”	”	”	”						”		”
e.c.	**Sargent Bay**	”	”	”		”	”	”	”				”		”		”
e.c.	**Shamrock Bay**	”	”	”		”	”	”	”				”		”		”
e.c.	**Shipley Bay**	”	”	”		”	”	”	”				”		”		”
e.c.	**Sitkoh Bay**	”	”	”		”	”	”	”				”		”		”
e.c.	**Steamer Bay**	”	”	”		”	”	”	”				”		”		”
e.c.	**Cape Esperance**	”	”	”		”	”	”	”				”		”		”
e.c.	**Takanis Bay**	”	”	”		”	”	”	”				”		”		”
e.c.	**Thetis Bay**	”	”	”		”	”	”	”				”		”		”
e.c.	**Salamaua**	”	”	”		”	”	”	”				”		”		”
e.c.	**Makassar Strait**	”	”	”		”	”	”	”				”		”		”
e.c.	**Windham Bay**	”	”	”		”	”	”	”				”		”		”
e.c.	**Makin Island**	”	”	”		”	”	”	”				”		”		”
e.c.	**Lunga Point**	”	”	”		”	”	”	”				”		”		”
e.c.	**Hollandia**	”	”	”		”	”	”	”				”		”		”
e.c.	**Kwatalein**	”	”	”		”	”	”	”				”		”		”
e.c.	**Admiralty Islands**	”	”	”		”	”	”	”				”		”		”
e.c.	**Bouganville**	”	”	”		”	”	”	”				”		”		”
e.c.	**Matanikau**	”	”	”		”	”	”	”				”		”		”
e.c.	**Attu**	”	”	”		”	”	”	”				”		”		”
e.c.	**Roi**	”	”	”		”	”	”	”				”		”		”
e.c.	**Munda**	”	”	”		”	”	”	”				”		”		”
	—																
	Commencement Bay Class																
e.c.	**Commencement Bay**	12,000	553	75		16,000	Todd, Tacoma	1944	1944				2 *5-in.* (38 cal.), operates approx. 21 aircraft.		18		1000
e.c.	**Block Island**	”	”	”		”	”	”	”						”		”
e.c.	**Gilbert Islands**	”	”	”		”	”	”	”				”		”		”

e.c.	**Cape Gloucester**	”	”	”		”	”	”	”				”	”		”
e.c.	**Vella Gulf**	”	”	”		”	”	”	”				”	”		”
e.c.	**Kula Gulf**	”	”	”		”	”	”	”				”	”		”
e.c.	**Siboney**	”	”	”		”	”	”	”				”	”		”
e.c.	**Salerno Bay**	”	”	”		”	”	”	”				”	”		”
e.c.	**Puget Sound**	”	”	”		”	”	”	”				”	”		”
e.c.	**Saidor**	”	”	”		”	”	1945	”				”	”		”
e.c.	**Bairoko**	”	”	”		”	”	”	”				”	”		”
e.c.	**Rendova**	”	”	”		”	”	1944	”				”	”		”
e.c.	**Badoeng Strait**	”	”	”		”	”	1945	”				”	”		”
e.c.	**Sicily**	”	”	”		”	”	”	”				”	”		”
e.c.	**Point Cruz**	”	”	”		”	”	”	”				”	”		”
e.c.	**Mindoro**	”	”	”		”	”	”	”				”	”		”
e.c.	**Rabaul**	”	”	”		”	”	”	1946				”	”		”
e.c.	**Palau**	”	”	”		”	”	”	”				”	”		”
e.c.	**Tinian**	”	”	”			”	”	”				”	”		”
	—															
	Sangamon Class *															
e.c.	**Sangamon**	12,000	553	75		13,500 T. (G.)	Federal S.B. Co.	1939	1942				2 *5-in.* (51 cal.), operates approx. 21 aircraft.	18		1000
e.c.	**Suwannee**	”	”	”				”	”					”		”
e.c.	**Chenango**	”	”	”		”	Sun S.B. Co.	”	”					”		”
e.c.	**Santee**	”	”	”		”	”	”	”				”	”		”
	—															
	Prince William Class†															
e.c.	**Prince William**	8,330	492	69½		8,500	Todd, Tacoma	1942	1943				2 *5-in.* (38 cal.), operates approx. 21 aircraft, 1 catapult.	16½		800
	—															
	Bogue Class †															
e.c.	**Croatan**	7,800	492	69½		8,500	Todd, Tacoma	1942	1943					16½		800
e.c.	**Breton**	”	”	”		”	”	”	”							
e.c.	**Barnes**	”	”	”		”	”	”	”				”	”		”
e.c.	**Altamaha**	”	”	”		”	”	”	1942				”	”		”
e.c.	**Nassau**	”	”	”		”	”	”	”				”	”		”
e.c.	**Core**	”	”	”		”	”	”	”				”	”		”
e.c.	**Copahee**	”	”	”		”	”	1941	”				”	”		”
e.c.	**Card**	”	”	”		”	”	1942	”				”	”		”
e.c.	**Bogue**	”	”	”		”	”	”	”				”	”		”
	—															
e.c.	**Charger**	8,000	492	69½		8,500 (D.)	Sun S.B. Co.	1941	1942				1 *5-in.* (51 cal.), 21 aircraft.	16		800
	—															
e.c.	**Long Island**	7,886	492	69½		”	”	1940	1941				”	”		”
	—															

* Converted oilers. † Converted C3 cargo hulls.

UNITED STATES.—CRUISERS.

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost (exclusive of armament)	Armour		Armament		Speed	Fuel Oil	Complement
											Belt Deck	Gun position	Guns	Torpedo tubes			
		tons	ft.	ft.	ft.					£	in.	in.			knots	tons	
Worcester Class	**Worcester**	14,700					New York, S.B. Co.	Bdg.					12 *6-in.*				
	Roanoke	”						”									
Des Moines Class	**Des Moines**	17,000	716½	75⅓				Bdg.									
	Salem	”	”	”				”									
	Dallas	”	”	”				”									
	Newport News	”	”	”				”									
	One Other	”	”	”				”									
Baltimore Class	**Baltimore**	13,600	673½	69¾		120,000	Bethlehem (Quincy)	1942	1943				9 *8-in.* (50 cal.), 12 *5-in.* (38 cal.), many light A.A., 4 aircraft, 2 catapults.		30		1500
	Boston	”	”	”		”		”	”						”		”
	Canberra	”	”	”		”	”	1943	”						”		”
	Quincy	”	”	”		”	”	”	”						”		”
	Pittsburgh	”	”	”		”	”	1944	1944						”		”
	Saint Paul	”	”	”		”	”	”	1945				”		”		”
	Columbus	”	”	”		”	”	”	”				”		”		”
	Helena	”	”	”		”	”	1945	”				”		”		”
	Oregon City	”	”	”		”	”	”	”				”		”		”
	Albany	”	”	”		”	”	”	1946				”		”		”
	Rochester	”	”	”		”	”	”	”				”		”		”
	Bremerton	”	”	”		”	New York S.B. Co.	1944	1945				”		”		”
	Fall River	”	”	”		”		”	”				”		”		”
	Macon	”	”	”		”	”	”	”				”		”		”
	Toledo	”	”	”		”	”	1945	1946				”		”		”
	Los Angeles	”	”	”		”	Philadelphia N.Y.	1944	1945				”		”		”
	Chicago	”	”	”		”		”	”				”		”		”

Cleveland Class	**Cleveland**	10,000	608⅓	63		100,000 (G.)	New York S.B. Co. (Camden)	1941	1942			12 *6-in.* (47 cal.), 12 *5-in.* (38 cal.), many small A.A., 4 aircraft.		33		1200
	Columbia	”	”	”		”		”	”					”		”
	Montpelier	”	”	”		”		1942	”					”		”
	Denver	”	”	”		”	”	”	”					”		”
	Santa Fe	”	”	”		”	”	”	”			”		”		”
	Birmingham	”	”	”		”	Newport News	”	1943			”		”		”
	Mobile	”	”	”		”	”	”	”			”		”		”
	Vincennes	”	”	”		”	Bethlehem (Quincy)	1943	1944			”		”		”
	Pasadena	”	”	”		”		”	”			”		”		”
	Springfield	”	”	”		”	”	1944	”			”		”		”
	Topeka	”	”	”		”	”	”	”			”		”		”
	Biloxi	”	”	”		”	Newport News	1943	1943			”		”		”
	Houston	”	”	”		”	”	”	”			”		”		”
	Providence	”	”	”		”	Bethlehem (Quincy)	1944	1945			”		”		”
	Manchester	”	”	”		”		1945	1946			”		”		”
	Vicksburg	”	”	”		”	Newport News	1943	1944			”		”		”
	Duluth	”	”	”		”	”	1944	”			”		”		”
	Miami	”	”	”		”	Cramp S.B. Co.	1942	1943			”		”		”
	Astoria	”	”	”		”		1943	1944			”		”		”
	Oklahoma City	”	”	”		”	”	1944	”			”		”		”
	Little Rock	”	”	”		”	”	”	1945			”		”		”
	Galveston	”	”	”		”	”	1945	1946			”		”		”
	Amsterdam	”	”	”		”	Newport News	1944	1945			”		”		”
	Portsmouth	”	”	”		”	”	”	”			”		”		”
	Wilkes-Barre	”	”	”		”	New York S.B. Co. (Camden)	1943	1944			”		”		”
	Atlanta	”	”	”		”		1944	”			”		”		”
	Dayton	”	”	”		”		”	1945			”		”		”
	Fargo	”	”	”		”	”	1945	”			”		”		”
	Huntingdon	”	”	”		”	”	”	”			”		”		”
San Diego Class	**San Diego**	6000	541	52½	16½	75,000 (G.)	Bethlehem (Quincy)	1941	1942			12 *5-in.* guns, many light A.A.	8 *21-in.* (Q.)	33		700
	San Juan	”	”	”	”			1941	1942							
	Oakland	”	”	”	”	”	Bethlehem, (SanFrancisco)	1942	1943							
	Reno	”	”	”	”	”		1942	1943							
	Flint	”	”	”	”	”	”	1944	1944							
	Tucson	”	”	”	”	”	”	1944	1945							
	Juneau	”	”	”	”	”	Federal, Kearny	1945	1946							
	Spokane	”	”	”	”	”		”	”							
	Fresno	”	”	”	”	”	”	”	”							
Wichita Class	**Wichita**	10,000	614	61¾	19¾	100,000 (G.)	Philadelphia Navy Yard	1937	1939			9 *8-in.*, 8 *5-in.* A.A., many small A.A., 2 catapults, 4 aircraft.	None	32½	1650	1200

UNITED STATES.—CRUISERS—*continued.*

Class	NAME	Standard displacement	Length (extreme)	Beam	Draught	Horse-power. Type of machinery and boilers	Where built	Date of launch	Date of completion	Cost (exclusive of armament)	Armour		Armament		Speed	Fuel Oil	Complement
											Belt / Deck	Gun position	Guns	Torpedo tubes			
Brooklyn Class	**Savannah**	tons 9,700	ft. 608⅓	ft. 61¼	ft. 19¾	100,000 (G.)	N.Y.S. Co., Camden	1937	1938	£ 2,410,000 estimated	in. 5/3	in.	15 *6-in.*, 8 *5-in.* A.A., many small A.A., 4 seaplanes, 2 catapults.		knots 32½	tons 2100	1200
	Nashville	,,	,,	,,	,,	,,	N.Y.S. Co., Camden	1937	1938		,,				,,	,,	,,
	Brooklyn	,,	,,	,,	,,	,,	New York Navy Yard	1937	1938		,,		,,		,,	,,	,,
	Philadelphia	,,	,,	,,	,,	,,	Philadelphia Navy Yard	1937	1938		,,		,,		,,	,,	,,
	Phœnix	,,	,,	,,	,,	,,	N.Y.S. Co., Camden	1938	1938	2,395,000	,,		,,		,,	,,	,,
	Boise	,,	,,	,,	,,	,,	Newport News,	1936	1938	2,330,000	,,		,,		,,	,,	,,
	Honolulu	,,	,,	,,	,,	,,	New York Navy Yard	1937	1938		,,		,,		,,	,,	,,
	St. Louis —	,,	,,	,,	,,	,,	Newport News	1938	1938		,,		,,		,,	,,	,,
New Orleans Class	**Tuscaloosa**	9975	588	61¾	19½	107,000 W.G.T. (Tuscaloosa) P.T.(G.)	New York S.B. Co.	1933	1934	2,090,000 estimated			9 *8-in.* (55 cal.), 8 *5-in.* (25 cal.) A.A., many small A.A., 2 catapults, 4 seaplanes, 50 mines.		32·7	1650	,,
	San Francisco	9950	,,	,,	,,		Mare Island Navy Yard	1933	1934		,,				,,	,,	,,
	New Orleans	9950	,,	,,	,,		New York Navy Yard	1933	1934	2,460,000	,,				,,	,,	,,
	Minneapolis —	9950	,,	,,	,,	,,	Philadelphia Navy Yard	1933	1934	2,460,000	,,				,,	,,	,,
Portland Class	**Portland**	9800	610¼	66	17¼	107,000 P.T.(G.)	Bethlehem S.B. Co. Quincy	1932	1933	2,210,000	4/2		9 *8-in.* (55 cal.), 8 *5-in.* (25 cal.) A.A., many small A.A., 2 catapults, 4–6 aircraft.		32·7	,,	,,

Chester Class	**Chester**	9200	600¼	66	16½	107,000 P.T.(G.)	New York, S.B. Co.	1929	1930	2,230,000	$\frac{3}{2}$		9 *8-in.* (55 cal.), 8 *5-in.* (25 cal.) A.A., many small A.A., 2 catapults, 4–6 seaplanes.		32½	1500	1200
	Louisville	9050	"	"	"	"	Puget Sound Navy Yard	1930	1931	2,290,000	$\frac{3}{2}$				"	"	"
	Augusta	9050	"	66	"	"	Newport News S.B. Co.	1930	1931	2,170,000	$\frac{3}{2}$		"		"	"	"
Omaha Class	**Cincinnati**	7050	555½	55⅓	13½	90,000 P.T.(G.)	Tacoma Wash.	1921	1924	1,730,000	$\frac{3}{1\frac{1}{2}}$		10 *6-in.* 8 *3-in.*, several small A.A., 2 aircraft, 2 catapults, 30 mines.	6 21-in. (T.)	33	1800	800
	Concord	"	"	"	"	"	Philadelphia (Cramp)	1921	1924	1,742,000					"	"	"
	Detroit	"	"	"	"	90,000 C T.(G.)	Bethlehem S.B. Co., Quincy	1922	1923	1,584,000	$\frac{3}{1\frac{1}{2}}$		"	"	"	"	"
	Trenton	"	"	"	"	90,000 P.T.(G.)	Philadelphia (Cramp)	1923	1924	1,823,000	$\frac{3}{1\frac{1}{2}}$		"	"	"	"	"
	Marblehead	"	"	"	"	"	Philadelphia (Cramp)	1923	1924	1,810,000	"		"	"	"	"	"
	Memphis	"	"	"	"	"	Tacoma, Wash.	1924	1925	1,838,000	"		"	"	"	"	"
	Omaha	7050	555½	55⅓	13½	90,000 P.T.(G.)	Tacoma, Wash.	1920	1923	1,823,000	$\frac{3}{1\frac{1}{2}}$		"	"	"	"	"
	Raleigh	"	"	"	"	90,000 C.T.(G.)	Bethlehem S.B. Co., Quincy	1923	1924	1,616,000			"	"	"	"	"
	Richmond	"	"	"	"	"	Philadelphia (Cramp)	1921	1923	1,742,000	"		"	"	"	"	"
Pensacola Class	**Salt Lake City**	9100	585½	65¼	16	107,000 P.T.(G.)	New York S.B. Co.	1929	1929	3,400,000	$\frac{3}{1\frac{1}{2}}$		10 *8-in.* (55 cal.), 8 *5-in.* (25 cal.) A.A., many small A.A., 2 catapults, 4 planes.		32·7	3000	1200
	Pensacola	"	"	"	"	"	Navy Yard, New York	1929	1930						"	"	"

UNITED STATES.—FLOTILLAS.

Name or number	Where built	Completed	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fue Oil
			Length (extreme)	Beam	Draught								
			Feet	Feet	Feet		Tons		Knots				Tons
DESTROYERS—													
Gearing Class :													
Gearing	Federal, Port Newark	1945	390½	40¾		2	2,400	60,000	35	6 5-in. (38 cal.) 40-mm. A.A.	10 21-in.	350	
Eugene A. Greene		,,											
Gyatt		,,											
Kenneth D. Bailey		,,											
William R. Rush		,,											
William W. Wood		,,											
Wiltsie		,,											
Theo. E. Chandler		,,											
Hamner		,,											
Epperson		Bdg.											
Castle		,,											
W. R. Thompson		,,											
Frank Knox	Bath Iron-works	1944											
Southerland		,,											
William C. Lawe	Bethlehem, San Francisco	1945											
Lloyd Thomas		,,											
Keppler		,,											
Lansdale		Bdg.											
Seymour D. Owens		,,											
Hoel		,,											
Abner Read		,,											
Rowan	Todd, Seattle	1945											
Gurke		,,											
McKean		,,											
Henderson		,,											
R. B. Anderson		,,											
James E. Kyes		,,											
Hollister		Bdg.											
Eversole		,,											
Shelton		,,											
Seaman		,,											
Chevalier	Bath Iron-works	1945											
Highbee		,,											
Benner		,,											
Dennis J. Buckley		,,											
Corry	Consolidated Steel, Orange	,,											
New		,,											
Holder		,,											
Rich		,,											
Johnston		,,											
Robert H. McCard		,,											
Samuel B. Roberts		Bdg.											
Basilone		,,											
Carpenter		,,											
Agerholme	Bath Iron-works	,,											
Robert A. Owen		,,											
Timmerman		,,											
Myles C. Fox		1945											
Everett F. Larson		,,											
Goodrich		,,											
Hanson		,,											
Herbert J. Thomas		,,											
Turner		,,											
Charles P. Cecil		,,											
Geo. K. Mackenzie		,,											
Sarsfield		,,											
Ernest G. Small		,,											
Power		,,											
Glennon		,,											
Noa		,,											
Fiske		,,											
Warrington		,,											
Perry		,,											
Baussell		,,											
Ozbourne		Bdg.											
Robert L. Wilson		,,											
Witek		,,											
Richard E. Kraus		,,											
J. P. Kennedy, Jr.	Beth. Quincy	1945											
Rupertos		,,											
Leonard F. Mason		Bdg.											
Charles H. Roan		,,											
Fred T. Berry	Bethlehem, San Pedro	1945											
Norris		,,											
McCaffery		,,											
Harwood		,,											

United States—*continued.*

Name or number	Where built	Completed	Dimensions			Number of screws	Standard displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel
			Length (extreme)	Beam	Draught								Oil
DESTROYERS—*contd*			Feet	Feet	Feet		Tons		Knots				Tons
Gearing Class—contd.													
Vogelsgegang	Bethlehem, Staten Island	1945	390½	40¾		2	2,400	60,000	35	6 5-in. (38 cal.) 40-mm. A.A.	10 21-in.	350	
Steinaker		,,											
Harold Ellison		,,											
Charles R. Ware		,,											
Cone		,,											
Stribling		,,											
Brownson		,,											
Arnold J. Isbell		,,											
Fechteler		,,											
Damato		Bdg.											
Forrest Royal		,,											
Hawkins	Consolidated Steel, Orange	1945											
Duncan		,,											
Henry W. Tucker		,,											
Rogers		,,											
Perkins		,,											
Vesole		,,											
Leary		,,											
Dyess		,,											
Bordelon		,,											
Furse		,,											
Newman K. Perry		,,											
Floyd B. Parks		,,											
John R. Craig		,,											
Orleck		,,											
Brinckley Bass		,,											
Stickell		,,											
O'Hare		,,											
Meredith		,,											
Sumner Class :													
Allen M. Sumner	Federal, Kearny	1944	376½	40¾		2	2,200	60,000	35	6 5-in. (38 cal.) 40-mm. A.A.	10 21-in.	350	
Moale		,,											
Ingraham		,,											
English		,,											
Chas. S. Sperry		,,											
Ault		,,											
Waldron		,,											
Haynsworth		,,											
John W. Weeks		,,											
Hank		,,											
Wallace L. Lind		,,											
Borie		,,											
Compton		,,											
Gainard		,,											
Soley		,,											
Harland R. Dickson		1945											
Hugh Purvis		,,											
Barton	Bath Ironworks	1943											
Walke		1944											
Laffey		,,											
O'Brien		,,											
De Haven		,,											
Mansfield		,,											
Lyman K. Swenson		,,											
Collett		,,											
Maddox		,,											
Hyman		,,											
Purdy		,,											
*Robert H. Smith		,,											
*Thomas E. Fraser		,,											
*Shannon		,,											
*Harry F. Bauer		,,											
*Adams		,,											
*Tolman		,,											
Blue	Bethlehem, Staten Island	,,											
Brush		,,											
Taussig		,,											
Samuel L. Moore		,,											
Harry E. Hubbard		,,											
*Henry A. Wiley		,,											
*Shea		,,											
*J. Wm. Ditter		,,											
A. A. Cunningham		,,											
John R. Pierce		,,											
Frank E. Evans		1945											
John A. Bole		,,											
Beatty		,,											

* Completed as minelayers

United States—*continued.*

Name or number	Where built	Completed	Dimensions Length (extreme)	Beam	Draught	Number of screws	Standard Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel Oil
DESTROYERS—*contd.*			Feet	Feet	Feet		Tons		Knots				Tons
Sumner Class—contd.													
Putnam	Bethlehem, San Francisco	1944	376½	40¾		2	2,400	60,000	35	6 5-in. (38 cal.) 40-mm. A.A.	10 21-in.	350	
Strong		1945											
Lofberg		,,											
John W. Thomason		,,											
Buck		,,											
Henley		,,											
Lowry	Bethlehem, San Pedro	1944											
*Lindsey		,,											
*Gwin		,,											
*Aaron Ward		,,											
Hugh W. Hadley		,,											
William Keith		,,											
James C. Owens		1945											
Zellars	Todd-Pacific, Seattle	1944											
Massey		,,											
Douglas H. Fox		,,											
Stormes		1945											
R. K. Huntingdon		,,											
Bristol	Bethlehem, San Pedro	,,											
Fletcher Class :													
Fletcher	Federal	1942	376½	39⅓		2	2,050	60,000	35	5 5-in. (38 cal.) 40 mm. A.A.	10 21-in.	300	
Radford		,,											
Jenkins		,,											
La Vallette		,,											
Nicholas	Bath Ironworks	,,											
O'Bannon		,,											
Saufley	Federal	,,											
Waller		,,											
Taylor	Bath Ironworks	,,											
Bache	Bethlehem Staten Island	,,											
Beale		,,											
Guest	Boston Navy Yard	1943											
Bennett		,,											
Fullam		,,											
Hudson		,,											
Hutchins		1942											
Stanly	Charleston, N.Y.	,,											
Stevens		1943											
Halford	Puget Sound, N.Y.	,,											
Leutze		1944											
Philip	Federal	1942											
Renshaw		,,											
Ringold		,,											
Schroeder		1943											
Sigsbee		,,											
Conway	Bath Ironworks	1942											
Cony		,,											
Converse		,,											
Eaton		,,											
Foote		,,											
Terry		1943											
Thatcher		,,											
Anthony		,,											
Wadsworth		,,											
Walker		,,											
Daly	Bethlehem, Staten Island	,,											
Isherwood		,,											
Kimberley		,,											
Ammen	Bethlehem, San Francisco	,,											
Mullany		,,											
Trathen		,,											
Hazelwood		,,											
Heerman		,,											
McCord		,,											
Miller		,,											
Owen		,,											
The Sullivans		,,											
Stephen Potter		,,											
Tingey		,,											
Twining		,,											
Yarnall		,,											

* **Completed as minelayers.**

United States—*continued.*

Name or number	Where built	Completed	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
			Feet	Feet	Feet		Tons		Knots				Tons
DESTROYERS—*contd.*													
Fletcher Class—contd.													
Boyd	Bethlehem, San Pedro	1943	376½	39⅓		2	2,050	60,000	35	5 5-in. (38 cal.) 40-mm. A.A.	10 21-in.	300	
Bradford		,,											
Brown		,,											
Cowell		,,											
Capps	Gulf S.B. Co.	,,											
David W. Taylor		,,											
Evans		,,											
John D. Henley		1944											
Franks	Seattle-Tacoma	1943											
Haggard		,,											
Hailey		,,											
Laws		,,											
Pritchett		1944											
Robinson		,,											
Ross		,,											
Rowe		,,											
Smalley		,,											
Stoddard		,,											
Watts		,,											
Wren		,,											
Aulick	Consolidated Steel, Orange	1942											
Charles Ausburn		,,											
Claxton		,,											
Dyson		,,											
Harrison		1943											
John Rodgers		,,											
McKee		,,											
Murray		,,											
Sproston		,,											
Wickes		,,											
Young		,,											
Charette	Boston Navy Yard	,,											
Conner		,,											
Hall		,,											
Haraden		,,											
Newcomb		,,											
Bell	Charleston Navy Yard	,,											
Burn		,,											
Izard		,,											
Paul Hamilton		,,											
Howorth	Puget Sound Navy Yard	1944											
Killen		,,											
Hart		,,											
Metcalfe		,,											
Shields		1945											
Wiley		,,											
Abbot	Bath Ironworks	1943											
Braine		,,											
Erben		,,											
Hale		,,											
Sigourney		,,											
Stembel		,,											
Albert W. Grant	Charleston, N.Y.	[illegible]											
Caperton	Bath Ironworks	,,											
Cogswell		,,											
Ingersoll		,,											
Knapp		,,											
Bearss	Gulf S.B. Co.	1944											
John Hood		,,											
Van Valkenburgh		,,											
Charles J. Badger	Bethlehem, Staten Island	1943											
Colahan		,,											
Dashiell	Federal	,,											
Bullard		,,											
Kidd		,,											
Bennion	Boston, N.Y.	,,											
Heywood L. Edwards		1944											
Richard P. Leary		,,											
Bryant	Charleston, N.Y.	1943											
Black	Federal	,,											
Chauncey		,,											
C. K. Bronson		,,											
Cotten		,,											

United States—*continued*.

Name or number	Where built	Completed	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
			Feet	Feet	Feet		Tons		Knots				Tons
DESTROYERS—*contd.*													
Fletcher Class—contd.													
Dortch	Federal	1943	376½	39½		2	2,050	60,000	35	5 5-in. (38 cal.) 40-mm. A.A.	10 21-in.	300	
Gatling		,,											
Healy		,,											
Hickox		,,											
Hunt		,,											
Lewis Hancock		,,											
Marshall		,,											
McDermut		,,											
McGowan		,,											
McNair		,,											
Meluin		,,											
Hopewell	Bethlehem,	,,											
Porterfield	San Pedro	,,											
Stockham	Bethlehem,	1944											
Wedderburn	San Francisco	,,											
Picking	Bethlehem,	1943											
Halsey Powell	Staten Island	,,											
Uhlmann		,,											
Remey	Bath	,,											
Wadleigh	Ironworks	,,											
Norman Scott		,,											
Mertz		,,											
Cassin Young	Bethlehem,	1944											
Irwin	San Pedro	,,											
Preston		,,											
Benham	Bethlehem,	1943											
Cushing	Staten Island	1944											
Monssen		,,											
Jarvis	Seattle-	,,											
Porter	Tacoma	,,											
Gregory		,,											
Rooks		,,											
Somers Class—													
Davis	Bath	1938	381	36¼	10½	2	1,850	52,000	35	5 5-in., several 40-mm.	8 21-in. (Q)	300	
Jouett	Bath	1939											
Sampson	Bath	1938											
Somers	Federal	1937											
Selfridge Class—													
Balch	Bethlehem	1936	381	36¼	10½	2	1,850	50,000	35	5 5-in., 8 40-mm.	8 21-in. (Q)	300	
Clark	Bethlehem	,,											
McDougall	New York	,,											
Moffett	Bethlehem	,,											
Phelps	Bethlehem	,,											
Selfridge	Bethlehem	,,											
Winslow	New York	1937											
Bristol Class—													
Bailey	Bethlehem	1942	348⅓	36	10	2	1,630	50,000	35½	4 5-in., several 40-mm.	5 21-in.	250	
Baldwin	Seattle	1943											
Bancroft	Bethlehem	1942											
Boyle	Bethlehem	,,											
Buchanan	Federal	,,											
*Butler	Philadelphia	,,											
Caldwell	Bethlehem	,,											
*Carmick	Seattle	,,											
Champlin	Bethlehem	,,											
Coghlan	Bethlehem	,,											
*Cowie	Boston	,,											
*Davison	Federal	,,											
*Doran	Boston	,,											
*Doyle	Seattle	1943											
*Earle	Boston	1942											
Edwards	Federal	,,											
*Ellyson	Federal	,,											
*Endicott	Seattle	,,											
Farenholt	Bethlehem	,,											
*Fitch	Boston	,,											
*Forrest	Boston	,,											
Frankford	Seattle	1943											
Frazier	Bethlehem	1942											
Gansevoort	Bethlehem	,,											
*Gherardi	Philadelphia	,,											

* Employed as minesweepers.

United States—*continued.*

Name or number	Where built	Completed	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
			Feet	Feet	Feet		Tons		Knots				Tons
DESTROYERS—*contd.*													
Bristol Class—contd.													
Gillespie	Bethlehem	1942											
*Hambleton	Federal	1941											
*Harding	Seattle	1943											
Herndon	Norfolk	,,											
Hobby	Bethlehem	1942											
*Hobson	Charleston	,,											
*Jeffers	Federal	,,											
Kalk	Bethlehem	,,											
Kendrick	Bethlehem	,,											
*Knight	Boston	,,											
Lansdowne	Federal	,,											
Lardner	Federal	,,											
Laub	Bethlehem	,,											
*Macomb	Bath	,,											
MacKenzie	Bethlehem	,,											
McCalla	Federal	,,											
*McCook	Seattle	,,											
McLanahan	Seattle	1943											
Meade	Bethlehem	1942	348⅓	36	10	2	1,630	50,000	35½	4 5-in., several 40-mm.	5 21-in.	250	
*Mervine	Federal	,,											
Murphy	Bethlehem	,,											
Nelson	Federal	,,											
Nields	Bethlehem	1943											
Ordronaux	Bethlehem	,,											
Parker	Bethlehem	1942											
*Quick	Federal	,,											
*Rodman	Federal	,,											
Satterlee	Seattle	1943											
Shubrick	Norfolk	,,											
Stevenson	Federal	,,											
Stockton	Federal	,,											
*Thompson	Seattle	,,											
Thorn	Federal	,,											
Tillman	Charleston	1942											
Wells	Seattle	1943											
Woodworth	Bethlehem	1942											
Benson Class—													
Benson	Bethlehem	1940											
Charles F. Hughes	Puget	,,											
Eberle	Bath	,,											
Edison	Federal	1941											
Ericson	Boston	,,											
Gleaves	Bath	1940											
Grayson	Charleston	1941											
Hilary P. Jones	Charleston	1940											
Kearny	Federal	,,											
Livermore	Bath	,,	348⅓	36	10	2	1,630	50,000	35½	4 5-in., several 40-mm.	5 21-in.	250	
Ludlow	Boston	1941											
Madison	Boston	1940											
Mayo	Bethlehem	,,											
Niblack	Bath	,,											
Nicholson	Charleston	1941											
Plunkett	Federal	1940											
Swanson	Charleston	1941											
Wilkes	Boston	,,											
Woolsey	Bath	,,											
Anderson Class—													
Anderson	Federal	1939											
Hughes	Federal	,,											
Morris	Norfolk	1940											
Mustin	Federal	1939	348	35½	10	2	1,570	50,000	36	4 5-in., several 40-mm.	8 21-in. (Q)	250	
Roe	Charleston	1940											
Russell	Newport	1939											
Wainwright	Norfolk	1940											
McCall Class—													
Ellet	Federal												
Lang	Federal												
Maury	Bethlehem												
Mayrant	Boston												
McCall	Bethlehem	1939	341¼	34¾	9¾	2	1,500	50,000	36	4 5-in., several 40-mm.	8 21-in. (Q)	250	
Rhind	Philadelphia												
Stack	Norfolk												
Sterett	Charleston												
Trippe	Boston												
Wilson	Puget												

* Employed as minesweepers.

United States—*continued.*

Name or number	Where built	Completed	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
DESTROYERS—*contd.*			Feet	Feet	Feet		Tons		Knots				Tons
Craven Class—													
Bagley	Norfolk	1938	341¼	34¾	9¾	2	1500	50,000	36	4 5-in., several smaller A.A.	16 21-in. (Q)	250	
Craven	Bethlehem												
Gridley	Bethlehem												
Helm	Norfolk												
Mugford	Boston												
Patterson	Puget												
Ralph Talbot	Boston												
Fanning Class—													
Dunlap	Bethlehem	1936	341⅓	34¾	9¾	2	1500	50,000	36	4 5-in., several 40-mm.	12 21-in. (Q)	250	
Fanning	Staten I	1938											
Mahan Class—													
Case	Boston	1937	341⅓	34¾	9¾	2	1500	50,000	36	4 5-in., several 40-mm.	12 21-in. (Q)	250	
Cassin	Philadelphia	,,											
Conyngham	Staten I	,,											
Cummings	Staten I	1936											
Downes	Boston	1937											
Drayton	Bath	1936											
Flusser	Federal	,,											
Lamson	Bath	1937											
Shaw	Philadelphia	,,											
Smith	Mare I	1936											
Farragut Class—													
Aylwin	Philadelphia	1935	341	34¼	9½	2	1400	50,000	36½	4 5-in., several 40-mm.	8 21-in. (Q)	250	
Dale	New York	,,											
Dewey	Bath	1934											
Farragut	Bethlehem	,,											
Macdonough	Boston	1935											
*William B. Preston	Norfolk, N.W.	1920	314⅓	31	9·8	2	1190	26,000	35	4 4-in., 1 3-in. A.A. (Kane, Fox, Brooks, Gilmer, and Hatfield have 4 5-in. guns)	4 triple 21-in.	200	375
Hulbert	,,	1920	,,	,,	,,	,,	,,	,,	,,			,,	,,
†Trever	Navy Yard, Mare Island.	1922	,,	,,	,,	,,	,,	,,	,,		,,	,,	,,
†Zane		1921	,,	,,	,,	,,	,,	,,	,,		,,	,,	,,
Litchfield	,,	1920	,,	,,	,,	,,	,,	,,	,,		,,	,,	,,
*Thornton	Bethlehem S.B. Co., Squantum	1919	,,	,,	,,	,,	,,	,,	,,		,,	,,	,,
*Ballard		,,	,,	,,	,,	,,	,,	27,000	,,		,,	,,	,,
‡Greene		,,	,,	,,	,,	,,	,,	,,	,,		,,	,,	,,
*Gillis	Bethlehem S.B. Co., Quincy	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
‡Belknap		,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Lawrence	New York S.B. Co.	1921	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
†Hopkins		,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Goff	,,	1921	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Williamson	,,	1920	,,	,,	,,	,,	,,	,,	,,		,,	,,	,,
‡Sands	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
King	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
*Childs	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
‡Overton	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
*McFarland	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
‡Humphreys	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
‡Kane	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Fox	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
‡Gilmer	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
‡Brooks	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Hatfield	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Paul Jones	Cramp, Pa.	1921	314·4	,,	,,	,,	,,	,,	,,	4 4-in., 1 3-in. A.A. (Whipple has 4 5-in. guns.)	6 21-in. (T)	122	,,
John D. Ford	,,	1920	,,	,,	,,	,,	,,	,,	,,			,,	,,
McCormick	,,	,,	,,	,,	,,	,,	,,	26,000	,,		,,	,,	,,
Bulmer	,,	,,	,,	,,	,,	,,	,,	,,	,,		,,	,,	,,
MacLeish	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Whipple	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
†Southard	,,	1919	,,	,,	,,	,,	,,	,,	,,	4 4-in., 1 3-in. A.A.	,,	,,	,,
†Chandler	,,	,,	,,	,,	,,	,,	,,	,,	,,		,,	,,	,,
‡George E. Badger	Newport News S.B. Co.	1921	,,	,,	,,	,,	,,	25,000	,,	4 4-in., 1 3-in. A.A.	,,	,,	375
‡Goldsborough		1920	,,	,,	,,	,,	,,	,,	,,		,,	,,	,,
Dahlgren	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
‡Clemson	,,	1919	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
†Stansbury	Union, I.W.	1919	314·4	31	9·8	,,	1 060	27,000	35	4 4-in., 1 3-in. A.A.	,,	,,	283
†Howard	,,	,,	,,	,,	,,	,,	,,	,,	,,		,,	,,	,,
†Hogan	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,

* Seaplane tenders. † Minesweepers. ‡ High-speed Transport.

United States—*continued.*

Name or number	Where built	Completed	Dimensions: Length (extreme)	Dimensions: Beam	Dimensions: Deaught	Number of screws	Displacement Surf./Sub.	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel Oil
DESTROYERS—*contd.*			Feet	Feet	Feet		Tons		Knots				Tons
Schenck	N.Y. S.B. Co.	1919	314·4	31	9·8	2	1090	26,000	35	4 4-in.. 1 3-in. A.A.	6 21-in.	122	286
J. Fred Talbot	Cramp, Phil.	,,	,,	,,	,,	,,	,,	,,	,,			,,	,,
Cole	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Ellis	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Dupont	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Biddle	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Barney	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Breckinridge	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
‡Roper	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
†Elliot	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Upshur	,,	1918	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
†Hamilton	Mare Island, N.Y.	1919	,,	21	9·5	,,	,,	24,200	,,	,,	,,	,,	,,
Kennison		1919	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
‡Kilty	,,	1918	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
†Boggs	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
Babbitt	New York S.B. Co.	1919	,,	31	9·8	,,	,,	26,000	,,	,,	,,	,,	,,
‡Tattnall		,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
†Lamberton	Newport News S. Co.	1918	,,	,,	,,		,,	25,000	,,	,,	,,	,,	,,
†Dorsey	Cramp, Pa.	,,	,,	,,	,,		,,	26,000	,,	4 4-in., 1 3-in. A.A. (Rathburne has 3 4-in.)	,,	,,	,,
‡Dent	,,	,,	,,	,,	,,		,,	,,	,,		,,	,,	,,
‡Waters	,,	,,	,,	,,	,,		,,	,,	,,		,,	,,	,,
‡Talbot	,,	,,	,,	,,	,,	,,	,,	,,	,,		,,	,,	,,
‡Rathburne	,,	1919	,,	,,	,,		,,	,,	,,		,,	,,	,,
Crane	Bethm., Quincy	1919	,,	,,	,,		1060	27,000	,,	4 4-in., 1 3-in. A.A.	,,	,,	283
Chew		,,	,,	,,	,,		,,	,,	,,		,,	,,	,,
‡Schley	,,	1918	,,	,,	,,		,,	,,	,,	,,	,,	,,	,,
‡Stringham	Bethm., San Fran.	,,	,,	,,	,,		,,	,,	,,	,,	,,	,,	,,
‡Manley	Bath, I.W.	1917	315·5	30·7	9·5		1020	20,000	32	3 4-in., 1 3-in. A.A.	,,	,,	260
Allen	,,	,,	315·3	29·9	9·8		920	17,500	30	4 4-in., 1 3-in. A.A.	,,	,,	290
*Preble	Bath Ironworks	1920	314·4	30·5	9	2	1160	27,000	35	4 4-in., 1 3-in. A.A., 92 mines	,,	107	375
*Pruitt		,,	,,	,,	,,	,,	,,	,,	,,		,,	,,	,,
*Sicard	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
*Tracy	Cramp	,,	,,	,,	,,	,,	,,	25,000	,,	,,	,,	120	286
*Ramsay	Newport News S. Co.	1919	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
*Breese		,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
SUBMARINES— *Albacore Class :*													
Angler	Electric Boat Co.	1943-44	311	27		2	1525 —	6500 —	21 —	1 4-in. or 5-in.	10 21-in.		
Bashaw													
Bergall	,,												
Besugo	,,												
Blenny	,,												
Blower	,,												
Blueback	,,												
Bluegill	,,												
Bream	,,												
Caiman	,,												
Cavalla	,,												
Cobia	,,												
Croaker	,,												
Dace	,,												
Flasher	,,												
Flounder	,,												
Gabilan	,,												
Gunnel	,,												
Gurnard	,,												
Haddo	,,												
Hake	,,												
Hoe	,,												
Jack	,,												
Lapon	,,												
Mingo	,,												
Muskallonge	,,												
Paddle	,,												
Pargo	,,												

* **Minelayers.** † **Minesweepers.** ‡ **High-speed Transports.**

United States—*continued.*

Name or number	Where built	Completed	Dimensions			Number of screws	Displacement Surf./Sub.	Horse-power	Maximum speed Surf./Sub.	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
SUBMARINES—*contd.* *Albacore Class—contd.*			Feet	Feet	Feet		Tons		Knots				Tons
Pogy	Manitowoc S.B. Co.	1943-44	311	27		2	1525 —	6500 —	21 —	1 4-in. or 5-in.	10 21-in.		
Pompon	,,												
Puffer	,,												
Hammerhead	,,												
Peto	,,												
Icefish	,,												
Jallao	,,												
Rasher	,,												
Raton	,,												
Ray	,,												
Redfin	,,												
Rock	,,												
Sawfish	Portsmouth N.Y.												
Steelhead	,,												
Sunfish	Mare Island N.Y.												
Tunny	,,												
Tinosa	,,												
Apogon	Portsmouth, N.Y.	1943											
Aspro	,,												
Batfish	,,												
Baldo	,,												
Billfish	,,												
Bowfin	,,												
Cabrilla	,,												
Crevalle	,,												
Archerfish	,,												
Burrfish	,,												
Sandlance	,,												
Picudo	,,												
Pampanito	,,												
Parche	,,												
Bang	,,												
Pilotfish	,,												
Pintado	,,	1944											
Pipefish	,,												
Piranha	,,												
Plaice	,,												
Pomfret	,,												
Sterlet	,,												
Queenfish	,,												
Razorback	,,												
Redfish	,,												
Ronquil	,,												
Scabbardfish	,,												
Segundo	,,												
Sennet	,,												
Piper	,,												
Threadfin	,,												
Tench	,,												
Thornback	,,												
Tigrone	,,												
Trulta	,,												
Toro	,,												
Torsk	,,												
Quillback	,,												
Argonaut	,,	1945											
Runner	,,												
Conger	,,												
Cutlass	,,												
Diablo	,,												
Medregal	,,												
Requin	,,												
Irex	,,												
Sea Leopard	,,												
Odax	,,												
Sirago	,,												
Perch	Electric Boat Co.	1944											
Sealion	,,												
Barbero	,,												
Baya	,,												
Becuna	,,												
Boarfish	,,												
Charr	,,												
Chubb	,,												

United States—*continued.*

Name or number	Where built	Completed	Dimensions Length (extreme)	Beam	Draught	Number of screws	Displacement Surf./Sub.	Horse-power	Maximum speed Surf./Sub.	Armament	Torpedo tubes	Complement	Fuel Oil
			Feet	Feet	Feet		Tons		Knots				Tons
SUBMARINES—*contd.*													
Albacore Class—contd.													
Brill	Electric Boat Co.	1944	311	27		2	1525 —	6500 —	21 —	1 4-in. or 5-in.	10 21-in.		
Bugara	,,												
Bullhead	,,												
Bumper	,,												
Cabezon	,,												
Dentuda	,,												
Capitaine	,,												
Carbonero	,,	1945											
Carp	,,												
Catfish	,,												
Entemedor	,,												
Chivo	,,												
Chopper	,,												
Clamagore	,,												
Cobbler	,,												
Cochino	,,												
Guavina	Manitowoc	1943											
Guitarro	,,	1944											
Hardhead	,,												
Hawksbill	,,												
Kraken	,,												
Lamprey	,,												
Lizardfish	,,												
Loggerhead	,,	1945											
Macabi	,,												
Mapiro	,,												
Menhaden	,,												
Mero	,,												
Devilfish	Cramp	1944											
Hackleback	,,	,,											
Ling	,,	1945											
Lionfish	,,	1944											
Manta	,,	1945											
Moray	,,	,,											
Roncador	,,	,,											
Sabalo	,,	,,											
Tirante	,,	1944											
Seahorse	Mare Island, N.Y.	1943											
Skate	,,	,,											
Tilefish	,,	,,											
Spadefish	,,	1944											
Spot	,,	,,											
Springer	,,	,,											
Stickleback	,,	1945											
Wahoo	,,	Bdg.											
Corsair	Electric Boat Co.	1945											
Unicorn	,,	,,											
Walrus	,,	,,											
Pomodon	Portsmouth, N.Y.	,,											
Remora	,,	,,											
Sarda	,,	Bdg.											
Spinax	,,	,,											
Volador	,,	,,											
Amberjack	Boston, N.Y.	1945											
Grampus	,,	,,											
Pickerell	,,	,,											
Grenadier	,,	,,											
Gato	Electric Boat Co.	1943–44											
Greenling	,,												
Grouper	,,												
Guardfish	,,												
Atule	Portsmouth N.Y.												
Drum	,,												
Flying Fish	,,												
Finback	,,												
Haddock	,,												
Halibut	,,												
Seacat	,,												
Seadevil	,,												
Seadog	,,												
Seafox	,,												
Sea Poacher	,,												
Sea Robin	,,												
Sea Owl	,,												

United States—*continued.*

Name or number	Where built	Completed	Dimensions			Number of screws	Displacement Surf./Sub.	Horse-power	Maximum speed Surf./Sub.	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
SUBMARINES—*contd.*			Feet	Feet	Feet		Tons		Knots				Tons
Albacore Class —contd.													
Spikefish	Portsmouth N.Y.	1943–44	307	27		2	1526 / —	6500 / —	21 / —	1 4-in.	10 21-in.		
Silversides	Mare Island N.Y.												
Trepang	„												
Whale	„												
Barb	Electric Boat Co.												
Blackfish	„												
Bluefish	„												
Cod	„												
Cero	„												
Blackfin	„												
Dragonet	Cramp												
Kingfish	Portsmouth N.Y.												
Shad	„												
"M" Class													
Mackerel	Electric Boat Co.	1941	253	21½	12	2	800 / —	16,000	14½ / —	1 3-in.	6 21-in.		
Marlin	Portsmouth N.Y.	1942	„	„	„	„	„	„	„	„	„		
T" Class													
Tambor	Electric Boat Co.	1940	307	27	13·3	2	1475 / —			1 3-in.	10 21-in.		
Tautog	„	„	„	„	„	„	„			„	„		
Thresher	„	1941	„	„	„	„	„			„	„		
Gar	Mare Island N.Y.	1941	„	„	„	„	„			„	„		
Tuna	„	„	„	„	„	„	„			„	„		
New "S" Class													
Salmon	Electric Boat Co.	1939	„	26	14½	„	1450 / —		17 / 8	„	8 21-in.	55	
Seal	„	„	„ „	„	„	„	„		„	„	„	„	
Skipjack	„	„	„	„	„	„	„		„	„	„	„	
Snapper	Portsmouth N.Y.	1938	„	„	„	„	„		„	„	„	„	
Stringray	„	„	„	„	„	„	„		„	„	„	„	
Sturgeon	Mare Island N.Y.	„	„	„	„	„	„		„	„	„	„	
Sargo	Electric Boat Co.	1939	„	„	„	„	„		„	„	„	„	
Saury	„	„	„	„	„	„	„		„	„	„	„	
Spearfish	„	„	„	„	„	„	„		„	„	„	„	
Sailfish (*ex*-Squalus)	Portsmouth N.Y.	1940	„	„	„	„	„		„	„	„	„	
Sea Dragon	Electrical Boat Co.	„	„	„	„	„	„		„		„	„	
Sea Raven	Portsmouth N.Y.	„	„	„	„	„	„		„	„	„	„	
"P" Class													
Porpoise	Portsmouth N.Y.	1936	283	24·9	13	2	1310 / 1934	5000	21	1 4-in.	6 21-in.	55	
Pike	„	„	„	„	„	„	„	„	„	„	„	„	
Tarpon	Electric Boat Co.	„	298	25·1	13·9	2	1315	5000	21	1 3-in.	6 21-in.	„	
Permit	„	1936–1937	300½	25	13·8	2	1330 / 1998		17 / 8	1 4-in.	6 21-in.	54	
Plunger	Portsmouth N.Y.	„	„	„	„	„	„	„	„	„	„	„	
Pollack	„	„	„	„	„	„	„	„	„	„	„	„	
"D" Class													
Dolphin	Portsmouth N.Y.	1932	319	27·8	13	2	1540 / 2215	4250 / 875	17 / 8	1 4-in., 1 M.	6 21-in.	64	
"C" Class													
Cachalot	Portsmouth N.Y.	1934	271½	24·8	13	2	1110 / 1650	3100 / 800	17 / 8	1 3-in. A.A., 1 M.	6 21-in.	52	
Cuttlefish	Electric Boat Co.	„	„	„	„	„	„	„	„	„	„	„	
"N" Class													
Narwhal	Portsmouth N.Y.	1930	371	33·3	16	2	2730 / 3960	5450 / 1270	17 / 8·5	2 6-in.	6 21-in.	88	185
Nautilus	Mare Island N.Y.	„	„	„	„	„	„	„	„	„	„	„	„
"B" Class													
Bonita	Portsmouth N.Y.	1926	341·5	27	14·6	2	2000 / 2506	6700 / 1200	19 / 8	1 3-in. A.A., 2 M.	6 21-in.	87	160
Bass	„	1925	„	„	„	„					„	„	„
Barracuda	„	„	„	„	„	„	„	„	„	„	„	„	„

United States—*continued.*

Name or number	Where built	Completed	Dimensions			Number of screws	Displacement Surf./Sub.	Horse-power	Maximum speed Surf./Sub.	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
SUBMARINES—*contd.*			Feet	Feet	Feet		Tons		Knots				Tons
"S" Class													
S48	Lake T.B. Co., Bridgeport	1922	267	21·8	13·5	2	1000 1458	2000 1500	14·8 11·0	1 4-in.	5 21-in.	38	237
S47*	Bethlehem Ship-building Corpn., Quincy Plant	1925	225·3	20·5	16	2	850 1126	1200 1500	14 10·4	1 4-in.	4 21-in.	44	154
S46*		,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S45*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S43*	,,	1924	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S42*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S41*	Bethlehem Ship-building Corpn., Union Plant	1924	219·3	,,	,,	,,	800 1062	1200 1500	14·5 11	1 4-in.	4 21-in.	42	140
S40*	,,	1923	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S38*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S37*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S35*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S34*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S33*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S32*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S31*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S30*	,,	1920	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S23*	Bethlehem Ship-building Corpn., Quincy Plant	1923	219·3	20·5	16	2	800 1062	1200 1500	14·5 11	1 4-in.	4 21-in.	42	140 ,,
S20*	,,	1922	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S18*	,,	1923	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S17	Lake T.B. Co., Bridgeport	1921	231	21·5	13	2	790 1092	2000 1200	15·25 9	,,	4 21-in.	38	123
S16	,,	1920	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S15	,,	1921	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S14	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S13	Portsmouth N.Y.	1923	231	21·8	13	2	790 1092	2000 1200	14·75 9	,,	5 21-in.	38	123
S12	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
S11	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
R20*	Union, I.W.	1918	186·1	17·5	14·5	2	530 680	880 934	13·5 10·5	1 3-in.	4 21-in.	33	63
R18*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
R17	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
R16*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
R15*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
R14*	Fore River S.B. Co.	1919	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
R13*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
R11*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
R10*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
R9*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
R7*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
R6*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
R5*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
R4*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
R2*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
R1*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
O10*	,,	1918	172·3	17·5	14·4	2	480 624	880 740	14 10·5	,,	4 21-in.	30	73
O8*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
O7*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
O6*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
O4*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
O3*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,
O2*	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,

*** Designed by Electric Boat Co., Groton, Conn.**

The machinery contractors for the vessels of the E.B. Co. Design built in yards other than the Navy Yards were the New London Ship and Eng. Co., Groton, Conn, and the hulls were built under sub-contract from the E.B. Co.

United States—*continued.*

Name or class name and number of vessels in commission	Where built	Completed	Dimensions			Number of screws	Standard Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel Oil
			Length (extreme)	Beam	Draught								
			Feet	Feet	Feet		Tons		Knots				Tons
DESTROYER ESCORTS (grouped according to principal characteristics)—													
81		1943–1945	306	36¾		2	1275	6,000 (G.)	20	2 5-in. (38 cal.)	3 21-(T.)	220	
72		,,	,,	,,		,,	1450	12,000 (tur. elect.)	25	2 5-in. (38 cal.)	,,	,,	
103		,,	,,	,,		,,	1400	,,	25	3 3-in. (50 cal.)	,,	,,	
81		,,	,,	,,		,,	1200	6,000 (D.)	20	3 3-in. (50 cal.)	,,	,,	
58		,,	,,	,,		,,	1240	6,000 (Dies. elect.)	20	3 3-in. (50 cal.)	,,	,,	
65		,,	289½	35			1150	,,	20	3 3-in. (50 cal.)		200	
FRIGATES—													
77		1942–1945	304	37½		2	1100	5,500 (R.)	18	3 3-in. (50 cal.)		180	
CORVETTES—													
18		1942	205	33		1	925	2,750 (R.)	16	1 4-in., 1 3-in. H.A.		120	
GUNBOATS—													
Charleston	Chas. N.Y.	1936	328½	41¼	11⅓	2	2000	7,000 (G.)	20	4 6-in., 1 seaplane		200	
Tacloban	,,	1923	241	41¼	10		1270	850 (R.)	12	3 4-in.		175	
Sacramento	Cramp	1914	226	40¾	9½		1140	950 (R.)	12½	3 4-in.		,,	
Paducah		1905	200	35			1000	1000 (R.)	13	,,		,,	
Bubuque		1905	,,	,,			,,	,,	,,	,,		,,	
Vixen, Williamsburg, Beaumont, San Bernardino, Dauntless—converted yachts.													
MOTOR TORPEDO BOATS—													
Vosper Type (138)		**1942**	**70**	**19**		**3**	**43**	**4,050**	**40**	**2 21-in. (in tubes)**		**12**	
Elco ,, (358)		,,	**80½**	**20½**		**3**	**45**	**4,050**	**40**	**4 21-in. (in racks)**		**14**	
Huckins ,, (18)		,,	**78**	**19½**	**6**	**3**	**48**	**4,050**	**40**	**4 21-in. (in tubes)**		**12**	
Higgins ,, (224)		,,	**78**	**20**	**6**	**3**	**46**	**4,050**	**40**	**4 21-in. (in racks)**		**12**	
Trumpy ,, (24)		**1944**	**63**	**15½**	**4**	**2**	**24**	**1,260**	**28**	**No torpedoes**		**10**	
Elco ,, (49)		**1941**	**77**	**20**	**5½**	**3**	**45**	**4,050**	**40**	**2 2-in.**		**12**	
MINELAYERS—													
Terror	**Philadelphia**	**1942**	**453½**	**60½**		**2**	**5875**	**11,000 (G.)**		**4 5-in.**		**400**	
Shawmut	**Cramp**	**1916**	**350**	**57**			**5300**	**2,700**	**12**	**3 3-in.**		**350**	
Weekhawken	,,	**1920**	,,	,,			,,	,,	,,	,,		,,	
Wassul		**1924**	**230½**	**42**			**1400**	**2,080**	**16**	**1 3-in.**		**300**	
Monadnock		**1941**	**280½**	**48½**			**3638**	**5,000**	**17**	**2 3-in.**		**350**	
Chimo		**1943**	**188**	**37**		**1**	**700**	**600**	**10**			**100**	
Planter		,,	,,	,,		,,	,,	,,	,,			,,	
Barricade		,,	,,	,,		,,	,,	,,	,,			,,	
Barbicon		,,	,,	,,		,,	,,	,,	,,			,,	
Bastion		,,	,,	,,		,,	,,	,,	,,			,,	
Obstructor		,,	,,	,,		,,	,,	,,	,,			,,	
Picket		,,	,,	,,		,,	,,	,,	,,			,,	
Trapper		,,	,,	,,		,,	,,	,,	,,			,,	
Buttress		,,	,,	,,		,,	,,	,,	,,			,,	
A number of *ex*-destroyers (see destroyer tables).													
MINESWEEPERS—													
Raven Class (66)		**1940–1945**	**220½**	**32**		**2**	**890**	**3,500 (Dies. elect.)**	**18**	**1 3-in.**		**100**	
Admirable Class (131)		**1942–1945**	**184½**	**33**		**2**	**795**	**1,800 (Dies. elect.)**	**15**	**1 3-in.**		**100**	
Accentor Class (64)		**1941–1942**	**97**	**21**			**190**	**400 (D.)**	**10**			**50**	

United States—*continued.*

Class name and number of vessels in commission	Where built	Completed	Dimensions Length (extreme)	 Beam	 Draught	No. of screws	Standard Displacement	Horse-power	Maximum speed	Armament	Torpedo tubes	Complement	Fuel Oil
MINESWEEPERS—*contd.*			Feet	Feet	Feet		Tons		Knots				Tons
Motor Minesweepers (approx. 300)		1941–	136	24½		2	210	1,000 (D.)	12	1 3-in.		50	
A number of *ex*-destroyers (see destroyer tables).													
SUBMARINE CHASERS—													
PCE Type (50)		1943	184½	33			795	2,400 (D.)	20	2 3-in.		110	
PC Type (300)		,,	173½	23			280	3,600 (D.)	20	1 or 2 3-in.		80	
PCS Type (60)		,,	136	23½			267	1,000 (D.)	14½	2 3-in.		40	
SC Type (300)		1942	111	17			95	2,400 (D.)	20	1 3-in.		49	
,,		1918	110	15½			75	660	17	1 3-in.		40	

SEAPLANE TENDERS.—Cumberland, St. George, Hamlin, Kenneth Whiting, Albemarle, Curtiss, Currituck, Norton Sound, Pine Island, Salisbury Sound, 8,625 tons, 18 knots, 4 5-in., 24 seaplanes; Greenwick Bay, Floyds Bay, Gardiners Bay, Duxbury Bay, Corson, Cook Inlet, Castle Rock, Suisun, Barataria, Bering Strait, Rehoboth, Orca, Uniamk, Onslow, Halfmoon, Coos Bay, Chincoteaque, Shellikof, Yakutat, San Carlos, San Pablo, Absecon, Mackinac, Casco, Barnegat, 1,650 tons, 20 knots, 1 5-in. gun; several *ex*-merchant ships; Sandpiper, Thrush, Swan, Heron, Pelican, Avocet, Teal, Lapwing (1918–19), 840 tons, 14 knots, 2 3-in. (*ex*-minesweepers); William B. Preston, Ballard, Gillis, Childs (1919–20) (*ex*-destroyers).

DESTROYER TENDERS.—Hamul, Arcadia, Everglades, Frontier, Yellowstone, Klondike, Shenandoah (1945), 8,180 tons, 492 ft., 16½ knots; Dixie, Prairie, Piedmont, Sierra, Yosemite, Grand Canyon, Isle Royal, Great Lakes, Tidewater, Bryce Canyon (1942–5), 9,450 tons, 530 ft., 18 knots; Altair, Denebola (1921), 6,250 tons, 423¾ ft., 10½ knots; Dobbin, Whitney (1924), 8,325 tons, 483 ft., 16 knots; Cascade, Markab, 10,000 tons, 492 ft., 16½ knots; Alcor, 6,000 tons, 445 ft., 15 knots; Melville (1915), 5,250 tons, 417 ft., 15 knots; Black Hawk (1917), 5,600 tons, 420 ft., 12½ knots.

SUBMARINE TENDERS.—Holland (1919), 8,100 tons, 513 ft., 16 knots; Beaver (1910), 4,670 tons, 380 ft., 16½ knots; Fulton, Sperry, Bushnell, Howard W. Gilmore, Nereus, Orion, Proteus (1937), 9,250 tons, 529½ ft., 18 knots; Euryale (1941), 10,700 tons, 492½ ft., 16½ knots. For rescue duties—Chanticleer, Coucal, Florikan, Greenlet, Kittiwake, Petrel (1940), 1,780 tons, 251½ ft., 16½ knots.

OCEAN TUGS.—77 in number—600 tons, 143 ft., 1500 H.P. (D.), 12½ knots; 65 in number—1,280 tons, 205 ft., 3,000 H.P. (D. elect.), 16 knots.

SURVEYING SHIPS.—Pathfinder, Hydrographer, Oceanographer, Bowditch, Sumner, Dericsson.

AMMUNITION SHIPS.—Pyro, Nitro, Lassen, Mount Baker, Rainier, Shasta, Mauna Loa, Mazama, Sangay, Wrangell, Akutan, Firedrake, Vesuvius, Mount Katmai, Great Sitkin, Paracutin, Diamondhead.

REPAIR SHIPS.—Medusa, Prometheus, Vestal, Vulcan, Ajax, Hector, Delta, Rigel, Briareus, Amphion, Cadmus, Xanthus, Laertes, Dionysus.

REPAIR SHIPS (Battle Damage).—Aristaeus, Oceanus, Phaon, Zeus, Midas, Nestor, Sarpedon, Telamon, Ulysses, Demeter, Diomedes, Helios (*ex*-LST's).

REPAIR SHIPS (I.C. Engines).—Oglala, Luzon, Mindanao, Tutvila, Oahu, Cebu, Culebra Island, Mavi, Mona Island, Palawan, Samar, Kermit, Roosevelt, Hooper Island.

REPAIR SHIP (Heavy Hull).—Jason.

REPAIR SHIPS (Landing Craft).—Achelous, Amycus, Agenor, Adonis, Atlas, Egeria, Endymion, Coronis, Creon, Poseidon, Menelaus, Minos, Minotaur, Stentor, Tantalus, Typhon, Amphitrite, Askari, Bellerophon, Bellona, Chimaera, Daedalus, Gordius, Indra, Kriskna, Quirinus, Remus, Achilles (*ex*-LST's).

REPAIR SHIPS (Aircraft).—Chourre, Webster, Aventinus, Chloris.

SALVAGE VESSELS.—Viking, Crusader, Discoverer, Diver, Escape, Grapple, Preserver, Shackle, Warbler, Willet, Anchor, Protector, Extricate, Restorer, Cable, Chain, Curb, Current, Deliver, Grasp, Safeguard, Seize, Snatch, Valve, Vent, Accelerate, Harjurand, Brant, Clamp, Gear, Weight, Swivel, Tackle, Bolster, Conserver, Hoist, Opportune, Reclaimer, Recovery.

OILERS.—Cohocton, Tamalpais, Caney, Anacostia, Soubarissen, Tomahawk, Sebee, Ponganset, Pomanset, Ocklawaha, Mascoma, Canaba, Kennebago, Escambia, Alagash, Tolovana, Chipola, Taluga, Severn, Nantahala, Manatee, Marias, Aucilla, Elokimin, Chikaskia, Caliente, Cacapon, Ashtabula, Cimarron, Platte, Brazos, Ramapo, Sapelo, Trinity, Sepulga, Salinas, Tippecanoe, Rapidan, Cuyama, Mattole, Kaweah, Laramie, Sabine, Chemung, Guadalupe, Salamonie, Kaskasia, Chicopee, Housatonic, Kennebec, Merrimack, Winooski, Kankakee, Lackawana, Mattaponi, Monongahela, Tappahannock, Paturent, Victoria, Neches, Neosho, Suamico, Cache, Tallulah, Pecos, Atascosa, Chiwawa, Enoree, Saranac, Saugatock, Escalante, Neshanic, Niobrara, Millicoma, Schuylkill, Cossatot, Chepachet, Cowanesque.

GASOLINE TANKERS.—Nespelen, Natchaug, Namakagon, Mattabesset, Mogoketa, Chewaucan, Chestatee, Chehalis, Tombigee, Nemasket, Kishwaukee, Genesse, Elkhorn, Agawam, Susquehanna, Wabash, Rio Grande, Kern, Patapsco, Halawa, Kaloli, Mettawee, Pasquotank, Sakatonchee, Seekonk, Sequatchie, Wautauga, Ammonusuc, Calamus, Chiwaukum, Escatawpa, Gualala, Hiwassee, Kalamazoo, Kanawha, Ocklockonee, Oconee, Narraguagas, Ogeechee, Ontonagon, Yahara, Ponchatovla, Quastinet, Sacandaga, Tetonkaha, Towaliga, Tularosa, Wakulla, Yacona, Waupaca, Manokin, Sakonnet, Conemaugh, Klaskanine, Shikellamy, Nanticoke, Michigamme, Klickitat.

HOSPITAL SHIPS.—Relief, Solace, Comfort, Hope, Merry, Bountiful, Samaritan, Refuge, Haven, Benevolence, Tranquillity, Consolation, Repose, Sanctuary, Rescue.

SHIPS OF THE LESSER NAVIES.

BELGIUM.

SAILING TRAINING SHIP.—**Mercator.**

BULGARIA.

MOTOR TORPEDO BOATS.—2 in number (Lurssen, 1939), 60 tons, 30 knots, 1 M.A.A., 2 21-in. torpedo tubes.

PATROL VESSELS.—**Derzki, Khrabri,** and **Strogi** (ex-French, 1907–08), 97 tons, 17 knots, 2 1·85-in., 1 M., 2 18-in. torpedo tubes.

MINESWEEPERS.—2 in number (ex-French, 1918), 350 tons, 17 knots.

TRAINING SHIPS.—**Tsar Assen** (ex-Dutch, 1912), 240 tons, 9 knots, 2 2·6-in., 1 M.; **Kamcia** (1898), 10 knots; **Simeon,** 600 tons, 2 3-in.

MOTOR BOATS.—**Vzrif** and **Capitan Minkoff** (ex-French, 1918), 40 tons, 14 knots, 2 M.; **Belmoretz** and **Chernomoretz** (ex-French, 1918), 77 tons, 17 knots, 1 1·85-in., 2 M.

CHINA.

LIGHT CRUISERS.—**Ning Hai, Ping Hai,** 2,500 tons, 360 ft., 6 5·5-in., 6 3-in., 4 21-in. torpedo tubes.

CORVETTE.—**Fu-Po** (ex-H.M.S. Petunia), 1 4-in.

GUNBOATS.—**Chang Ning, Cheng Ning, Wu Ning, Sui Ning, Wei Ning,** and **Ye Ning** (Shanghai, 1933–34), 300 tons, 11 knots, 2 2·25-in., 3 M.; **Min Chuan** (Shanghai, 1931), 460 tons, 16 knots, 1 4·7-in., 1 4-in., 1 3-in., 2 2·24-in.; **Chu Chien** (Kobe, 1906); **Chu Kuan** and **Chu Tung** (Kobe, 1907), 11 knots, 1 3-in.; **Yung Sui** (Shanghai, 1929), 600 tons, 18 knots, 1 6-in., 1 4·7-in., 3 3-in., 2 2·24-in., 2 1·5-in. A.A., 4 M.; **Tutuila** (Shanghai, 1928), 370 tons, 14½ knots, 2 3-in., 10 M.; **Kiang Yuan,** 550 tons.

RIVER GUNBOATS.—**Ying Hao** (ex-Sandpiper, 1933), 185 tons, 11½ knots, 1 3·7-in. howitzer, 1 6-pdr.; **Ying Teh** (ex-Falcon), 372 tons, 15 knots, 1 3·7-in. howitzer, 2 6-pdr.; **Ying Shan** (ex-Gannet, 1925), 310 tons, 16 knots, 2 3-in. H.A.; **Kiang Hsi** and **Kiang Kan** (Germany, 1912), 140 tons, 9 knots; **Mei Yuan** (ex-USS Tutuila).

TORPEDO BOAT.—**Hu Chun** (Kobe, 1908), 96 tons, 20 knots, 1 1·85-in., 1 1·5-in., 3 14-in. torpedo tubes.

ARMED LAUNCHES.—15 in number.

ARMED TRANSPORTS.—25 in number

PATROL VESSELS.—4 in number.

COLOMBIA.

DESTROYERS.—**Caldas** and **Antioquia** (Yarrow, 1934), 1,282 tons, 319 ft. B.P., 31 ft. beam, 36 knots, 4 4·7-in., 3 1·5-in. A.A., 2 depth charge throwers, 8 21-in. torpedo tubes, 296 tons of oil fuel, 140 complement.

GUNBOATS.—**Mariscal Sucre** (Yarrow, 1909), 500 tons, 23 knots, 2 3-in., 3 M.; **Cordoba** (ex-French, 1919), 450 tons, 16 knots, 4 3-in.; **Pichincha, Carabobo,** and **Junin** (ex-French, 1925), 200 tons, 13 knots, 1 3-in., 2 M.; **Barranquilla** and **Cartagena** (Yarrow, 1930), 140 tons, 13·5 knots, 2 3-in., 8 M.; **A, B, C, D** (ex-German L.M. 15, 17, 19, 20, 1918), 12 tons, 28 knots, 2 M.; **Nos. 1, 2, 3, 4** (Yarrow, 1913), 20 tons, 12 knots, 1 1-pdr.

RIVER GUNBOAT.—**Presidente Mosquera,** 200 tons, 2 1·5-in.

TRANSPORTS.—**General Mosquera** (Caledon Shipbuilding Co., 1910), 3,500 tons, 2 3·5-in.; **Bogota** (ex-German, 1919), 500 tons, 16 knots, 1 3·5-in., 2 3-in., 2 M.

TRAINING SHIP.—**Cucuta** (ex-U.S.A., 1913), 5,378 tons gross, 10 knots.

COSTA RICA.

Coastal craft only.

CUBA.

LIGHT CRUISER.—**Cuba** (Cramp, Philadelphia, 1911), 2,055 tons, 18 knots, 6,000 H.P., 2 4-in., 6 3-in. H.A., 4 6-pdr., 4 3-pdr., 2 M., 250 tons of coal.

GUNBOATS.—**General Zagas,** 500 tons, 2 1-pdr.; **Capitan Fernandez Quevedo** (Havana, 1932), 115 tons, 12 knots, 1 3-in. H.A., 2 1-pdr.; **Habana, Pinar del Rio, Villas,** and **Matanzas** (Havana, 1912), 80 tons, 12 knots, 1 1-pdr.; **24 de Febrero** and **10 de Octubre** (J. S. White, 1911), 218 tons, 12 knots, 3 3-pdr.; **Baire** (Danzig, 1906), 500 tons, 14 knots, 4 3-in., 2 3-pdr., 1 M.; **Yara** (Middlesbrough, 1905), 450 tons, 12 knots, 1 3-in. H.A., 2 6-pdr.; **20 de Mayo** (Glasgow, 1895), 200 tons, 12 knots, 2 3-pdr., 1 1-pdr.; **Enrique Villuendus** (ex-U.S.A., 1899), 178 tons, 16 knots, 2 3-pdr.

TRAINING SHIP.—**Patria** (Cramp, Philadelphia, 1911), 1,200 tons, 16 knots, 2 3-in., 4 6-pdr., 4 3-pdr.

TRANSPORT.—**Carcorbe.**

SUBMARINE CHASERS.—12 in number (ex-U.S. C.G. Cutters).

DOMINICAN REPUBLIC.

COAST GUARD CUTTERS.—6 in number (ex-U.S.A. C.G. 110, 144, 302) (1924), 37 tons, 13·5 knots, 1 1-in.; C.G. 9, 10, 11 (ex-U.S.A. 1943) 47 tons, 13½ knots.

ECUADOR.

PATROL VESSELS.—**Tarqui,** 50 tons, 1 torpedo tube; 3 others (ex-U.S.A.).

TRAINING SHIP.—**Presidente Alfaro** (Southampton, 1917), 1,030 tons, 16 knots, 2 3-in.

GUNBOAT.—**Abdon Calderon** (ex-Cotopaxi) (1884), 300 tons, 10·5 knots.

TRANSPORT.—**Patria** (Lighthouse Service).

EGYPT.

PATROL VESSELS.—**Raqib** (Alexandria, 1938), 15 knots, 1 1·46-in.; **Al Sarea** (J. S. White, 1937), 13 tons, 36 knots, 1 1·46-in.; **El Amira Fawzia** (Swan Hunter, 1929), 2,640 tons, 14 knots, 2 3-pdr.; **El Amir Farouq** (Hawthorn Leslie, 1926), 1,441 tons, 17 knots, 1 6-pdr., 2 M.; **Mabahiss** (Swan Hunter, 1930), 618 tons, 11 knots, 1 3-pdr.

TRAINING SHIP.—**Abdel Monaym** (Clydebank, 1902), 610 tons, 18·5 knots.

INSPECTION VESSEL AND STORE CARRIER.—**Naphtys** (Kiel, 1905), 650 tons, 7·5 knots.

TRANSPORT.—**Sollum** (ex-Syringa, Workman Clark, 1917), 1,290 tons, 16 knots, 1 3-pdr.

ROYAL YACHT.—**Mahroussa** (Poplar, 1865), 4,561 tons, 16 knots.

COASTAL MOTOR BOATS.—**Darfeel** and **Noor El Bahr** (Thornycroft, 1926), 20 tons, 17 knots, 1 1·46-in.; **Qamar**, 23 tons, 11 knots; **El Hoot**, 24 tons, 7 knots.

ESTONIA.

TORPEDO BOAT.—**Sulev** (ex-German, 1917), 200 tons, 26 knots, 2 3-in., 2 18-in torpedo tubes, 10 mines.

SUBMARINES.—**Lembit** (Vickers, 1937), 620/820 tons, 13½/8½ knots, 1 1·57-in., 4 21-in. torpedo tubes, 20 mines.

MINELAYERS.—**Suurop** and **Ristna** (1906), 500 tons, 12 knots, 1 3-in., 1 1-pdr.

ICEBREAKERS.—**Suur Toll** (Stettin, 1914), 4,000 tons, 15 knots; **Tasuia** (1914), 1,100 tons; **Jaan Poska** (1929), 250 tons, 11 knots.

PEIPUS LAKE GUNBOATS.—**Ahti** (1908), 144 tons, 10 knots, 2 1·5-in., 2 1-pdr.; **Tartu**, 108 tons, 12 knots, 2 1·5-in., 2 M.

GUNBOAT.—**Laine** (1915), 450 tons, 12 knots, 2 3-in.

RIVER GUNBOAT.—**Mardus** (1911), 100 tons, 10 knots, 2 3-in., 2 M.

MINESWEEPERS.—**Keri** (ex-Kalev) and **Vaindlo** (ex-Olev) (1914), 50 tons, 9 knots, 1 3-pdr.; **Tahkona** (1919), 45 tons, 12 knots.

TUG.—**Tallin** (1900), 100 tons, 10 knots.

TENDERS.—**Kompass** (1919), 300 tons, 9 knots; **Sakala** (1906), 30 tons, 8 knots.

FINLAND.

ARMOURED VESSELS.—**Väinämöinen** (Crichton-Vulcan, 1932), 300 ft. length, 54 ft. beam, 3,900 tons, 15 knots, 4 10-in., 8 4·1-in. A.A., 4 M., 2-in. armour belt.

MOTOR TORPEDO BOATS.—**Sisu** and **Hurja** (ex-Italian, 1920), 13 tons, 25 knots, 2 M., 2 18-in. torpedo tubes; **Isku** (1925), 54 ft. length, 11 tons, 25 knots; **Syöksy, Nuoli, Vinha,** and **Raju** (1929), 13 tons, 35 knots, 2 M., 2 18-in. torpedo tubes.

SUBMARINES.—**Iku-Turso, Vetehinen** and **Vesihiisi** (Abo, 1930), 490/710 tons, 14·5/8·5 knots, 1 3-in., 4 21-in. torpedo tubes, 20 mines; **Vesikko** (Crichton Vulkan, Abo, 1933), 250/300 tons, 12/7 knots, 1 M., 3 21-in. torpedo tubes; **Saukko** (Helsingfors, 1930), 100/136 tons, 8/5·5 knots, 1 M., 2 18-in. torpedo tubes, 6 mines.

GUNBOATS.—**Turunmaa** (ex-Russian Orlan, 1918), 342 tons, 14 knots, 2 3-in., 5 6-pdr.; **Uusimaa** (ex-German Beo) and **Hämeenmaa** (ex-German Wulf, 1918), 400 tons, 15 knots, 2 4-in., 1 1·5-in. A.A.; **Aallokas** (1935).

MINELAYERS.—**Pommi, Paukku, Lieska, Miina, Loimu** (1916), 80 tons, 8 knots, 2 M., 24 mines; **Vakava** and **Klercker**, 300 tons.

Minesweepers.—**Rautu** (ex-Russian Murman, 1917) and **Vilppula** (1916), 165 tons, 12 knots, 2 3-in., 1 1·5-in. A.A.; **Ahven, Kiiski, Muikku,** and **Sarki** (1937), 17 tons. 10 knots.

Salvage Vessel.—**Mursu** (ex-Stannum) (1902), 615 tons gross, 8 knots.

Submarine Depot Ship.—**Louhi** (ex-Russian Voin, 1917), 640 tons, 11 knots, 2 1·85-in., 150 mines.

Motor Launches.—**Haukka, A.37, A.38, A.40, A.42, A.43, A.45, A.F.2, B.3, B.V.A.** and **B.V.D.** (1934), 9–25 tons, 8–10 knots, 1 M.

Patrol Boats.—**V.M.V. 1, 2, 5, 6** (1931), **V.M.V.** 8–17 (Germany, 1935), 30 tons, 25 knots, 1 ·75-in.

Training Ship.—**Suomen Joutsen** (St. Nazaire, 1902), 3,000 tons, 6 knots.

Icebreakers.—**Sisu** (Helsingfors, 1939), 2,000 tons, 15 knots, 2 4-in.; **Otso** (1936), 800 tons, 13 knots; **Jääkarhu** (1926), 4,825 tons, 15 knots; **Sampo** (Armstrong, 1899), 1,850 tons, 15 knots, 3 4·7-in.; **Tarmo** (ex-Sampo II) (Armstrong, 1907), 2,400 tons, 14 knots; 3 4·7-in.; **Murtaja** (Stockholm, 1890), 820 tons, 11 knots, 1 4·7-in.; **Apu** (Kiel, 1899), 600 tons, 13 knots, 2 4·7-in.; **Voima** (Sandvikens, 1924), 2,000 tons, 14 knots, 1 4·7-in.

HAYTI.

Special Service Vessels.—**Nord Alexis** (1891), 1,230 tons, 14 knots. 2 4·7-in.; **Veretieres** (1889), 270 tons, 9 knots, 2 M.; **17 Décembre,** 851 tons; **Pacifique,** 488 tons, 14 knots; **Savannah** (ex-U.S. C.G. Cutter).

HUNGARY.

Patrol Vessels.—**Debreczen, Gyor, Baja,** and **Sopron** (Budapest, 1918), 140 tons, 15 knots, 2 2·75-in., 2 M.; **Kecskemet** and **Szeged** (Budapest, 1915), 133 tons, 15 knots, 4 2·75-in., 2 M.

Auxiliary Vessels.—**Csobánc** (1926), 300 tons, 8 knots; **Körős** (1916), 170 tons; **Maros** (1927), 40 tons; **Mecsek,** 35 tons.

Motor Boats.—**Honved, Huszar,** and **Tuzer** (1916), 17 tons, 7 knots, 2 M.; 2 in number, 30 tons; 10 in number, 10 tons.

Training Ship.—**Badacsony** (1909), 230 tons, 10·5 knots.

ICELAND.

Fishery Protection Vessels.—**Aegir** (1925), 500 tons, 14 knots, 1 2·24-in.; **Thor** (ex-German, 1922), 300 tons, 10 knots, 1 2·24-in.; **Odinn** (1938), 72 tons, 11 knots, 1 1·85-in.; **Esja,** 1,347 tons (gross).

IRAQ.

Patrol Vessels.—**Nos. 1, 2, 3, 4** (Thornycroft, 1937), 100 ft. length, 64 tons, 12 knots, 1 3·7-in. howitzer, 4 M.

Yacht.—**Panfilo X** (ex-Sans Peur, J. Brown, 1923), 1,200 tons, 13 knots.

LATVIA (U.S.S.R. Baltic Fleet).

Submarine Depot Ship.—**Varonis** (1908), 250 tons, 10 knots.
Gunboat.—**Virsaitis** (ex-German, 1917), 380 tons, 16 knots, 2 3-in. 2 6-pdr., 1 3-in. H.A., 1 torpedo tube.
Surveying Vessel.—**Hidrografs** (Danzig, 1918), 450 tons, 10 knots.

LITHUANIA (U.S.S.R. Baltic Fleet).

Patrol Vessel.—**Prezidentas Smetone** (ex-German, 1917), 500 tons, 17 knots, 2 3-in., 3 M.

MANCHUKUO.

Destroyer.—**Hai Wei** (ex-Japanese Kashi, Maizura, 1917), 755 tons, 31·5 knots, 3 4·7-in, 3 M., 6 18-in. torpedo tubes.
Gunboats.—**Chingjen** and **Tingpien** (Harima, 1935), 290 tons, 13 knots, 2 4·7-in., 3 M.; **Shun T'ien** and **Yang Min** (Harima, 1934), 270 tons, 12 knots, 2 4·7-in. A.A., 3 M.; **Li Sui** (ex-German, 1910), 270 tons, 13 knots, 2 2·24-in., 2 M.; **Li Chi** (ex-German, 1904), 270 tons, 13 knots, 1 3-in., 4 M.; **Kuang Ning, Kuang Ch'ing,** and **Chiang T'ung** (1900), 200 tons, 9 knots, 1 3-in., 4 M.; **Ta T'ung** and **Li Min** (Kobe, 1933), 65 tons, 10·5 knots, 3 M.
Armed Launches.—**Chi Min** (Kawasaki, 1934), 20 tons, 10 knots, 2 M.; **En Min, Hui Min, P'u Min** (Kawasaki, 1933), 15 tons, 10 knots, 2 M.
Patrol Boats.—**Hailung** and **Haifeng** (Kawasaki, 1933), 184 tons, 14 knots, 2 3·1-in., 2 M.; **Hai Kuang, Hai Jui, Hai Jung, Hai Hua** (Kawasaki, 1933), 42 tons, 12 knots, 1 2·24-in., 2 M.; **Daichi Kaihen** and **Daini Kaihen** (Yokohama, 1933), 42 tons, 15 knots, 2 M.

MEXICO.

Sloops.—**Durango** (Valencia, 1936), 1,600 tons, 20 knots, 4 4-in., 2 twin 1-in. pom poms, 2 quadruple ·5-in. M., can carry 500 men and 80 horses; **Potosi** (Cadiz, 1935), **Queretaro** and **Guanajuato** (Ferrol, 1935), 1,200 tons, 20 knots, 3 4-in., 2 twin 1-in. pom poms, 2 quadruple ·5-in M. A.A., can carry 250 men and 20 horses.
Gunboats.—**G. Nos. 20–29** (Bilbao, 1935), 130 tons, 26 knots, 1 twin ·5 pom pom, 1 quadruple 1-in. pom pom.
Transports.—**Progreso** (Genoa, 1907), 1,590 tons, 13 knots, 4 6-pdr., 2 M.; **Bolivar** (1920), **Washington** (1920), **Moctezuma** (1919), **Coahuila** and **Jalisco** (Philadelphia, 1916), 5,794 tons, 10·5 knots, **Orizaba** (ex-Southern Cross, Glasgow, 1930).
Oil Tanker.—**Mexico** (1913), 2,559 tons (gross).
Patrol Boats.—**Mazatlan, Acapulco,** and **Vera Cruz** (Canada, 1918), 486 tons, 8 knots, 1 2·2-in., 2 1·5-in., 2 M., 2 ex-U.S. C.G. Cutters.
Submarine Chasers.—3 in number (ex-U.S.A.).

NICARAGUA.

Gunboat.—**Momotombo**, 400 tons, 2 3-in., 1 6-pdr.
Patrol Boat.—1 in number (ex-U.S.A., CG274) (1924), 37 tons, 75 ft., 13·5 knots, 1 1-pdr.

PARAGUAY.

GUNBOATS.—**Paraguay** and **Humaita** (Genoa, 1931), 636 tons, 17 knots, 4 4·7-in., 4 3-in. H.A., 2 M.; **Capitan Cabral** (Haarlem, 1907), 120 tons, 10 knots, 1 3-in., 2 6-pdr., 2 M.; **Taguari** (Hosking, 1910), 150 tons, 10 knots, 4 3-in., 2 1·46-in.

DESPATCH VESSEL.—**Teniente Herreros** (Conrad, 1908), 100 tons, 12 knots, 1 3-in., 2 1-pdr., 2 M.

PERSIA (IRAN).

PATROL VESSELS.—**Moti** (ex-Karkas), **Lal** (ex-Simorgh), **Hira** (ex-Chahbaaz), and **Nilam** (ex-Chahrokh) (Naples, 1932), 325 tons, 15 knots, 900 B.H.P., 2 3-in., 2 M.

MOTOR BOATS.—**Azerbaijan**, **Gehlani**, and **Mazenderan** (Palermo, 1935), 68½ ft., 28 tons, 14 knots, 1 1·5-in.

TUG.—**Niru** (1935), 14 knots.

PERU.

LIGHT CRUISERS.—**Almirante Grau** and **Coronel Bolognesi** (Vickers, 1907), 3,200 tons, 24 knots, 2 6-in., 8 3-in., 8 M., 2 18-in. torpedo tubes.

DESTROYERS.—**Almirante Guise** (ex-Russian, 1917), 1,400 tons, 35 knots, 5 3-in., 1 2-pdr. A.A., 1 M., 3 18-in. triple torpedo tubes; 80 mines; **Almirante Villar** (ex-Russian, 1918), 1,185 tons, 35 knots, 4 4-in., 1 2-pdr., 2 M., 3 18-in. triple torpedo tubes, 80 mines.

SUBMARINES.—**R.1–4** (U.S.A., 1926–28), 576/682 tons, 14·5/10 knots, 1 3-in. 4 21-in. torpedo tubes.

GUNBOATS.—**Amazonas** and **Loreto** (Electric S.B. Co., 1934), 250 tons, 15 knots, 4 3-in. H.A., 2 ·8-in., 2 M.; **America** (1904), 350 tons, 14 knots, 2 3-pdr.; **Coronel Portillo** (ex-San Pablo, 1902), 49 tons, 7 knots, 2 3-pdr.; **Iquitos** (1875), rebuilt, 1896, 50 tons, 7·5 knots, 4 1·46-in., 2 ·8-in., 2 M.; **Napo** (Yarrow, 1921), 98 tons, 12 knots, 3 1·8-in.

TRANSPORT.—**Rimac** (ex-Eten, 1907), 6,848 tons gross, 12 knots, cargo capacity, 7,000 tons.

OILER.—**Parinas** (Thornycroft, 1921), 2,820 tons, 10 knots, carries 4,300 tons of oil.

SUBMARINE CHASERS.—8 in number (ex-U.S.A.).

PHILIPPINES.

MOTOR TORPEDO BOATS.—4 in number (Thornycroft, 1939), 40 knots, 4 Lewis guns, 2 torpedo troughs.

POLAND.

CRUISER.—**Conrad** (ex-H.M.S. Danae).

DESTROYERS.—**Blyskawica** (J. S. White, 1937), 2,144 tons, 39 knots, 8 4-in., 4 1·57-in., 2 triple 21-in. torpedo tubes; **Burza** (Chantiers Navals, 1932), 1,540 tons, 33 knots, 2 5·1-in.. 1 2·9-in. H.A., 6 21·7-in. torpedo tubes; **Piorun** (ex-H.M.S. Nerissa, 1940); **Krakowiak** (ex-H.M.S. Silverston); **Slazak** (ex-H.M.S. Bedale, Hunt class), 6 4-in., 1 M.PP.; **Garland** (ex-British), 1,335 tons, 3 4·7-in., 36 knots, 4 21-in. torpedo tubes.

SUBMARINES.—**Sep** (Rotterdam, 1939), 1,090/1,450 tons, 14·5/11 knots, 1 4·1-in., 2 1·57-in. A.A., 12 21·7-in. torpedo tubes; **Zbik, Rys,** and **Wilk** (built in France, 1931–32), 965/1,230 tons, 14/9 knots, 1 3·9-in., 1 2-pdr. A.A., 6 21·7-in. torpedo tubes, 40 mines; **Sokol** (1941), **Dzik** (1942), ex-British Ursula Class.

MINESWEEPERS.—**Oxhoft** (ex-Zuraw) (Gydnia, 1939); **Czajka** (Modlin, 1936), 140 tons, 15 knots, 1 3-in., 4 M.

TRAINING SHIP.—**Iskra** (ex-British, 1917), Three Masted Schooner, 500 tons.

MOTOR GUNBOATS.—Several ex-British.

PORTUGAL.

DESTROYERS.—**Douro, Tejo, Dao** (Yarrow, Lisbon, 1935–36), **Lima** and **Vouga** (Yarrow, Glasgow, 1933), 1,220 tons, 33,000 S.H.P., 36 knots, 4 4·7-in., 3 1·5-in. A.A. pom poms, 2 quadruple 21-in. torpedo tubes, 20 mines, complement 164.

MOTOR TORPEDO BOATS.—6 in number.

SUBMARINES.—**Golfinho, Espadarte, Delfim** (Vickers, 1934–35), 900/1,100 tons, 2,300/1,000 B.H.P., 16·5/9·2 knots, 1 4-in., 2 M., 6 21-in. torpedo tubes.

GUNBOATS.—**Faro** and **Lagos** (Lisbon, 1928, 1932), 300 tons, 13 knots, 2 1·85-in.; **Ibo** (1912), **Mandovi** (1918), **Zaire** (1297), **Diu** (1932), built at Naval Arsenal, Lisbon, 400 tons, 13 knots, 2 3-in., 2 3-pdr., 2 M.

RIVER GUNBOATS.—**Rio Minho** (Lisbon, 1904), 37 tons, 7·5 knots, 1 1-pdr., 2 M.; **Tete** (Yarrow, 1904), 70 tons, 7·5 knots, 2 3-pdr., 3 1-pdr.

SLOOPS.—**Bartolomeu Dias** and **Afonso de Albuquerque** (Hawthorn Leslie, 1935), 1,780 tons, 21 knots, 4 4·7-in., 2 3-in. H.A., 4 pom poms, 2 depth charge throwers, 40 mines; **Joao de Lisboa** (ex-Infante don Henrique, 1937) and **Pedro Nunes** (1935), built at Lisbon, 1,080 tons, 17 knots, 2 4·7-in., 4 1·57-in. A.A., 2 depth charge throwers; **Goncalves Zarco** and **Goncalo Velho** (Hawthorn Leslie, 1933), 950 tons, 16·5 knots, 3 4·7-in., 2 1·57-in.

TRAINING SHIP.—**Sagres** (Bremerhaven, 1896), 3,100 tons, 7 knots.

AUXILIARIES.—**Lince** (Leghorn, 1911), 77 tons, 12 knots; **Vulcano** (Thornycroft, 1910), 500 tons, 12 knots; **Lidador** (Birkenhead, 1884), 200 tons, 9 knots, 2 3-pr.; **Acor** (1906), 227 tons (gross); **Almancil** (1930), 350 tons (gross); **Alberia** (1910), 320 tons (gross); **Algol** (1930), 340 tons (gross); **Altair** (1920), 341 tons (gross); **Azevia** (1941); **Bicuda; Corvina; Dourada; Espadilha; Fataca,** and others.

SURVEYING SHIPS.—**D. Joao de Castro** (Alfeite, 1941), 960 tons, 14 knots, 1 3-in., 1 aircraft; **Berrio** (La Loire, 1898), 350 tons, 10 knots; **Carvalho Araujo** (ex-H.M.S. Jonquil, 1915), 900 tons, 17 knots.

LIGHTHOUSE TENDER.—**Almirante Schultz** (Penhoey, 1929), 520 tons, 11·5 knots.

TANKER.—**Sambraz** (1942), 7,000 tons (capacity 3,500 tons), 12 knots, 1 3·9-in. A.A.

ROUMANIA.

DESTROYERS.—**Regele Ferdinand** and **Regina Maria** (Naples, 1930), 1,785 tons, length 348¾ ft., 42,000 S.H.P., 38 knots, 5 4·7-in., 1 3-in. H.A., 2 triple 21-in. torpedo tubes, 50 mines; **Marasti** (ex-Italian Sparviero, 1917), 1,460 tons, 40,000 S.H.P., 35 knots, 5 4·7-in. 4 3-in. H.A., 2 M., 2 double 18-in. torpedo tubes, 50 mines.

MOTOR TORPEDO BOAT.—**Viscolul** (ex-British, 1939), 70 ft. length, 30 tons, 41 knots, 8 M., 2 21-in. torpedo tubes.

TORPEDO BOATS.—**Sbornul**, and **Zmeul** (ex-Austrian, 1913–14), 260 tons, 28 knots, 2 2·6-in., 2 torpedo tubes in **Sbornul**.

SUBMARINES.—**Delfinul** (Fiume, 1936), 700/950 tons, 1,600/1,300 S.H.P., 14/9·5 knots, 1 4·2-in., 6 21-in. torpedo tubes; **S.1, S.2** (Galatz, 1941), 620/800 tons, 585/700 B.H.P., 4 21-in. torpedo tubes, 1 4-in., 16/8 knots.

SUBMARINE DEPOT SHIP.—**Constanta** (Fiume, 1930), 1,821 tons, 13 knots, 2 4-in.

RIVER MONITORS.—**Ioan Bratianu, Alexandru Lahovari** (Trieste, 1907–08), 680 tons, 13 knots, 3 4·7-in., 1 3-in. A.A., 2 1·85-in., 4 M.; **Bucovina** (ex-Austrian Sava, Budapest, 1916), 550 tons, 12 knots, 2 4·7-in., 2 4·7-in. howitzers, 2 2·6-in. A.A., 2 1·85-in. 6 M.; **Basarabia** (ex-Austrian Inn, Budapest, 1915), 590 tons, 12 knots, 2 4·7-in., 2 4·7-in. howitzers, 2 1·85-in., 9 M.; **Ardeal** (ex-Austrian Temes, Budapest, 1904), 450 tons, 10 knots, 2 4·7-in., 1 3·5-in. A.A., 2 1·85-in., 2 M.

GUNBOATS.—**Stihi** (ex-French Friponne, Lorient, 1917), **Dumitrescu** (ex-French Mignonne, Brest, 1917), **Ghiculescu** (ex-French Impatiente, Brest, 1916), 350 tons, 15 knots, 2 3·9-in., 2 M.

PATROL BOATS.—**Nos. 3 & 7** (Thornycroft, 1908), 100 ft., 50 tons, 18 knots, 1 3-pdr., 1 M.

RIVER GUNBOATS.—**Bistritsa, Oltul**, and **Siretul** (Blackwall, 1888), 100 tons, 12 knots, 1 6-pdr., 1 1-pdr.

MINELAYERS.—**Admiral Murgescu** (Galatz, 1940), and **Cetetea Alba** (Hamburg, 1940), 812 tons, 16 knots, 2 4-in., 2 1·46-in., 135 mines.

YACHTS.—**Luceafarul** (Glasgow, 1931), 1,580 tons, 17 knots; **Taifun** (Royal Yacht) (J. S. White, 1938), 34 tons; **Macin, Stefan Cel Mare**.

TRAINING SHIP.—**Mircea** (Hamburg, 1939), 1,750 tons, 10 knots.

MOTOR BOATS.—10 in number (some armoured), 40 tons, 14 knots.

ARMED MOTOR LAUNCHES.—7 in number, 30–50 tons.

THAILAND.

DESTROYER.—**Phra Ruang** (ex-British Radiant, Thornycroft, 1917), 718 tons, 29,000 S.H.P., 35 knots, 3 4-in., 1 2-pdr. pom pom., 1 M., 2 double 21-in. torpedo tubes.

TORPEDO BOATS.—**Jumbara, Pattani, Surasdra, Chandaraburi,** and **Rayong** (Monfalcone, 1937), 470 tons, 10,000 S.H.P., 31 knots, 3 3-in. A.A., 4 ·8-in. M., 6 18-in. torpedo tubes; **Puket** and **Trad** (Trieste, 1936), 380 tons, 9,000 S.H.P., 31 knots, 3 3-in. A.A., 4 ·8-in. M., 6 18-in. torpedo tubes.

MOTOR TORPEDO BOATS.—6 in number (Thornycroft, 1930–35), 55 ft., 13·5 tons, 2 torpedoes.

SUBMARINES.—**Blai Jumbol, Sinsamudr, Machanu, Virun** (Mitsubishi, 1938), 325 tons, 14·5/8 knots, 1 M., 5 21-in. torpedo tubes, complement 24.

GUNBOATS.—**Dhamburi** and **Sri Ayudhya** (Kobe, 1938), 2,000 tons, 15·5 knots, 4 8-in., 4 3-in.; **Sukhodaya** (Vickers, 1930), 890 tons, 13 knots, 2 6-in., 4 3-in. A.A., 2½-in. armour belt; **Mongkut Rajakumarn** (ex-Filipinas, Hong Kong and Whampoa Dock Co., 1887), 700 tons, 11 knots, 2 4·7-in., 2 6-pdr., 3 3-pdr.; **Sugbrib** (1901), 410 tons, 11·5 knots, 1 4·7-in., 5 6-pdr., 2 M.; **Suriya Monthon** (Thornycroft, 1908), 190 tons, 14·5 knots, 1 6-pdr., 4 M.; **Ratnakosindr** (Armstrong, 1925), 890 tons, 12 knots, 2 6-in., 4 3-in. H.A., 2½-in. armour belt.

MINELAYERS.—**Bang Rachan** (S1) and **Nong Sarai** (S2) (Monfalcone, 1936), 368 tons, 12 knots, 2 3-in., 140 mines.

PATROL BOATS.—**Klongyai, Takbai,** and **Kantang** (Yokohama, 1937), 110 tons, 18 knots ,1 3-in., 3 ·8-in. M., 2 18-in. torpedo tubes.

TRAINING SHIPS.—**Tachin** and **Maeklong** (Uraga, 1937), 1,400 tons, 17 knots, 4 4·7-in., 2 ·5-in. M. A.A., 2 double 12-in. torpedo tubes, 20 mines; **Chao Phra** (ex-British Havant, 1918), 700 tons, 16 knots.

SURVEY SHIPS.—**Han Thale, Lieu Thale,** and **Chen Thale,** 400 tons, 8 knots, **Cuong.**

FISHERY PROTECTION VESSELS.—**Sara Sindhu, Thiew Uthok, Travane Vari** (Bangkok, 1936), 50 tons, 9·5 knots, 1 1·5-in.

TUG.—**Samet** (ex-Pi-Sua-Nam), 90 tons, 9·5 knots.

TRANSPORTS.—**Angthong** (ex-Maha Chakkri, Kawasaki, 1918), 2,700 tons, 15 knots, 4 3-in.; **Chang** (ex-Vides Kichkar, Maryport, 1902), 750 tons, 9·5 knots; **Pagan** and **Sichaun** (Harima, 1938), 650 tons.

OIL TANKER.—**Samui** (Hakodate, 1936), 1,800 tons, 12 knots.

TURKEY.

BATTLE CRUISER.—**Yavouz Sultan Selim** (ex-Goeben, Hamburg, 1912), 22,734 tons, 52,000 S.H.P., 27 knots, 10 11-in., 10 5·9-in., 8 3·5-in., A.A., 14 1·5-in. m.p.p., 4 M., 4 19·7-in. torpedo tubes, complement 1,000.

CRUISERS.—**Hamidieh** (Armstrong, 1904), 3,790 tons, 12,000 H.P., 22 knots, 2 5·9-in., 6 3-in., 8 3-in. H.A., 2 18-in., torpedo tubes, 70 mines; **Medjidieh** (ex-Russian Prutt, Cramp, 1904), 3,300 tons, 12,000 H.P., 22 knots, 4 5·1-in., 2 3-in. H.A., 4 M.

Destroyers.—**Gayret** (ex-H.M.S. Oribi), **Kocatepe** and **Adatepe** (Ansaldo, 1932), 1,300 tons, 38,000 S.H.P., 38 knots, 4 4·7-in., 3 2-pdr. H.A., 3 M., 6 21-in. torpedo tubes, 40 mines; **Tinaztepe** and **Zafer** (Riva Trigoso, 1932), 1,240 tons, 50,000 S.H.P., 38 knots, 4 4·7-in., 3 2-pdr. A.A., 2 triple 21-in. torpedo tubes; **Sultan Hisar** and **Demir Hisar** (Denny Bros., 1941), **Muavenet** (Vickers, 1941), 1,370 tons, 34,000 S.H.P., 35 knots, 4 4·7-in., 6 1·5-in. A.A., 2 quadruple 21-in. torpedo tubes.

Torpedo Boats.—**Berk** (ex-Berkisatvet) and **Peyk** (ex-Peikishevket, Kiel, 1907), 830 tons, 20 knots, 2 4-in., 4 6-pdr., 2 1-pdr., 2 M., 3 18-in. torpedo tubes, 30 mines.

Motor Torpedo Boats.—A number building.

Motor Launches.—A number of ex-British Fairmiles.

Patrol Motor Boats.—**Doghan**, **Marti**, and **Deniz Kouchou** (Venice, 1932), 31 tons, 34 knots, 1 3-in., 1 1-in. pom pom., 2 18-in. torpedo tubes, 6 depth charges. A number building.

Submarines.—**Burak Reis**, **Murat Reis**, **Oruc Reis** (Vickers, 1941), 624/856 tons, 1,200/708 H.P., 13·7/8·4 knots, 1 4-in., 3 M., 5 21-in. torpedo tubes; **Atilay**, **Yildiray** (Istanbul, 1941), **Saldiray** (Kiel, 1939), 820/1,100 tons, 4,800 H.P., 20/9 knots, 1 4-in., 6 21-in. torpedo tubes, 40 mines; **Dumlupinar** (Monfalcone, 1932), 935/1,220 tons, 2,400/1,400 H.P., 15/9·5 knots, 1 4-in. H.A., 3 M., 4 2 1-in. torpedo tubes, 40 mines; **Gur** (Cadiz, 1931), 750/960 tons, 2,800/1,000 H.P., 20/9 knots, 1 4-in., 1 ·8-in. M., 6 21-in. torpedo tubes; **Inönü I** and **Inönü II** (Rotterdam, 1928), 433/556 tons, 1,100 H.P., 13·5/8·5 knots, 1 3-in. H.A., 1 M., 6 17·7-in. torpedo tubes; **Sakarya** (Monfalcone, 1932), 610/940 tons, 1,500/1,100 H.P., 14·5/9·3 knots, 1 4-in., 1 ·8-in M., 6 21-in. T.T.

Submarine Depot Ships.—**Erkin** (ex-S.S. Trier, Bremen, 1923), 16,000 tons, 12·5 knots, 2 M.; **Akin** (ex-Rasit, Smith's Dom Co., 1913), 33 tons, 12 knots; **Marmora** (ex-R.S. Syria, 1906), 1,500 tons.

Minesweepers.—**Hizir Reis**, **Issa Reis**, and **Kemal Reis** (La Seyne, 1912), 443 tons, 14 knots, 3 3-in., 2 3-pdr., 2 M.; 2 Motor Minesweepers (ex-British); 16 converted ferry boats and coastal craft.

Minelayers.—**Sivri Hisar** and **Yuzbashi Hakki** (Thornycroft, 1940), 350 tons, 15 knots, 1 3-in., 80 mines; **Atak** and **Dalgitch** (Ismidt, 1940, 1941), 500 tons, 13 knots, 40 mines; **Nusret** (ex-Yardim, Kiel, 1913), 360 tons, 15 knots, 2 M., 25 mines; **Uyanik** (ex-Intibah, Port Glasgow, 1886), 600 tons, 12 knots, 50 mines. Several others.

Oil Tankers.—**Gölcük** (Ismidt, 1937), 1,400 tons, 10 knots, 750 tons capacity; **Beykoz**, 435 tons (gross); **Istanbul**, 7,400 tons (D.W.), 15 knots.

Yachts.—**Gunes Dil** (ex-Savarona, Hamburg, 1931), 5,700 tons, 21 knots, 2 3-pdr.; **Ertougrul** (Armstrong, 1903), 900 tons, 21 knots, 8 3-pdr.; **Acar**.

Gunboat.—**Aidin Reis** (St. Nazaire, 1913), 502 tons, 14 knots, 2 4-in., 2 6-pdr., 4 M.

Depot Ship.—**Torghud Reis**.

URUGUAY.

Torpedo Gunboat.—**Uruguay** (Stettin, 1910), 1,150 tons, 23 knots, 2 4·7-in., 4 3-in., 6 1-pdr., 4 m., 2 18-in. torpedo tubes.

Patrol Boats.—**Paysandu, Salto,** and **Rio Negro** (Ancona, 1935), 150 tons, 16 knots, 2 3-in., 2 m.

Surveying Ships.—**18 De Julio** (Leith, 1879), 680 tons, 12 knots, 2 m.; **Capitan Miranda** (Cadiz, 1930), 516 tons, 12 knots.

Tugs.—**Zapican** (ex-Atlantico, 1911), 162 tons, 10 knots; **Vanguardia** (Glasgow, 1908), 95 tons, 12 knots, 2 1·5-in.; **Corsario** (1888), 130 tons, 10 knots, 3 1·5-in.; **Huracán** (ex-Fortuna, 1879), 197 tons, 12 knots.

Training Ship.—**Aspirante** (ex-Exir Dallen, 1919), 250 tons, auxiliary motor.

VENEZUELA.

Minelayers.—**General Soublette** (ex-Italian Dardanelli) and **General Urdaneta** (ex-Italian Milazzo) (Monfalcone, 1926), 615 tons, 15 knots, 2 4-in., 1 3-in. h.a., 80 mines.

Gunboats.—**Mariscal Sucre** (ex-Isla de Cuba, 1886), 1,125 tons, 10 knots, 2 6-in., 2 6-pdr., 6 3-pdr., 2 1-pdr., 1 m.; **General Salom** (ex-U.S. Atlanta, 1884), 750 tons, 12 knots, 1 3-in., 4 6-pdr., 2 m.; **Miranda** (Clydebank, 1895), 200 tons, 10 knots, 5 6-pdr.; **Brion,** 150 tons.

Tugs.—**Aragua** (ex-Caroni), 154 tons, 7 knots, 1 m.; **José Felix Ribas** (ex-Zumbador, 1894), 300 tons, 10 knots, 2 6-pdr., 1 m.

River Gunboats.—2 in number.

Yachts.—**Maracay** (1902), 800 tons, 8 knots, 2 3-in., 2 a.a., 1 m.; **Leandro** (ex-Dr. Brinkley, U.S.A., 1925), 320 tons, 18 knots, 2 1·46-in.

Patrol Vessels.—4 in number (ex-U.S. C.G. cutters).

Corvettes.—3 in number (ex-R.C.N.)

YUGOSLAVIA.

Destroyers.—1 in number (building at Split), 1,875 tons, 38 knots, 5 5·5-in., 10 1·57-in. a.a., 2 m., 6 21-in. torpedo tubes. Two others building.

Corvette.—**Nada** (ex-H.M.S. Mallow), 925 tons, 16 knots, 1 4-in.

Torpedo Boats.—**T. 1** (ex-Austrian, 1913–15), 200 tons, 5,000 S.H.P., 28 knots, 2 2·5-in. a.a., 2 m., 2 21-in. torpedo tubes.

Motor Torpedo Boats.—**Durmitor, Dinara, Kajmakcalan, Orsen, Rudnik, Suvobor, Triglav,** and **Velebit** (Bremen, 1936–37), 92 ft., 62 tons, 34 knots, 1 1·57-in. a.a., 2 21-in. torpedo tubes; **Cetnik** and **Uskok** (Thornycroft, 1927), 59 ft., 13 tons, 40 knots, 1 m., 2 18-in. torpedo tubes. 8 ex-U.S. P.T. Boats.

Submarines.—**Hrabri** and **Nebojsca** (Armonstrong, 1928), 870/1,146 tons, 2,400/1,600 B.H.P., 15/10 knots, 2 4-in., 6 21-in. torpedo tubes.

RIVER MONITORS.—**Varda** (ex-Austrian Bosnia, Budapest, 1916), 530 tons, 13 knots, 2 4·7-in., 2 4·7-in. howitzers, 3 2·6-in A.A., 2 1·85-in., 8 M.; **Drava** (ex-Austrian Enns, Budapest, 1915), 450 tons, 13 knots, 2 4·7-in., 2 4·7-in. howitzers, 2 2·6-in. A.A., 7 M.; **Sava** (ex-Austrian Bodrog, Budapest, 1904), 380 tons, 13 knots, 2 4·7-in., 1 4·7-in. howitzer, 1 2·6-in. A.A., 1 2·6-in. howitzer, 5 M.; **Morava** (ex-Austrian Koros, Budapest, 1892), 390 tons, 9 knots, 2 4·7-in., 2 9-pdr., 3 M.

MINELAYERS.—**Galeb, Kobac, Orao, Sokol** (ex-German M class, 1918–19), 330 tons, 15 knots, 2 3·9-in. H.A., 2 M., 40 mines.

MINESWEEPERS.—**Malinska, Marjan, Meljine, Mljet,** and **Mosor** (Yarrow, Kraljevica, 1931–32), 130 tons, 9 knots, 1 2·5-in. A.A. **D2** (ex-Austrian, 1889), 78 tons, 17 knots, 2 1·45-in., 1 M.

SEAPLANE TENDER AND DEPOT SHIP.—**Zmaj** (Hamburg, 1929), 1,870 tons, 15 knots, 1 4-in. A.A., 10 seaplanes.

SUBMARINE DEPOT SHIP.—**Hvar** (ex-Vintali, Sunderland, 1896), 2,000 tons, 13 knots: **Sitnica** (ex-Najade, 1891), 370 tons, 9 knots, 2 3-pdr.

SALVAGE VESSEL.—**Spasilac** (Kiel, 1930), 740 tons, 15 knots.

TRAINING SHIP.—Three masted schooner **Jadran** (Hamburg, 1933), 710 tons, auxiliary motor, 8 knots, 2 2-pdr.

YACHTS.—**Vila** (ex-Dalmata, 1896), 230 tons, 12 knots; **Dragor (1928)**, 250 tons, 10 knots.

TUGS.—**Jaki** (1915), 360 tons, 15 knots, 2 1·85-in.; **Mocni** (Antwerp, 1939), 260 tons, 11 knots, 2 1·85-in.; **Silni** (1914), 200 tons, 10 knots, 2 1·85-in.; **Marljivi** (1898), 130 tons, 10 knots; **Snazni,** 100 tons, 10 knots; **Ustrajni** (1917), 160 tons, 9 knots; **Cer** (1909), 250 tons, 15 knots, 2 M.; **Sisak** (ex-Triglav, 1915), 90 tons, 11 knots, 2 M.; **Sabak** (ex-Avala), 90 tons, 8 knots, 2 M.

PATROL BOATS.—**Granicar** and **Strazar** (1929), 36 tons, 9 knots, 1 3-pdr.

NAVAL AIRCRAFT.—BRITISH.

Name	Type	Dimensions				Weight		Engine					Performance						Armament
		Span	Length	Height	Wing area	Empty	Loaded	Name	Type	B.H.P. at speed at Ht.			Speed at Ht.		Service ceiling	Range		Initial climb	
		ft. in.	ft. in.	ft. in.	sq. ft.	lb.	lb.			B.H.P.	R.P.M.	ft.	M.P.H.	ft.		Miles.	Speed at M.P.H.	Ft./min.	
Hawker Sea Hurricane.	Single-engine single-seat fighter.	40 0	32 3	13 1½	258	..	8,200	Rolls-Royce Merlin II or III.	12-cyl. V liquid-cooled in-line.	1,280	..	16,250	309	22,000	31,000	..	..	..	8 Browning ·303, 4 20-mm. or 2 40-mm. 2 250- or 500-lb. bomb.
Vought Sikorsky Corsair.	Single-engine single-seat fighter	41 0	32 10	12 2	314	..	12,039	Pratt and Whitney Double Wasp.	18-cyl. Radial	2,000	..	..	417	19,900	35,000	1,700	..	2,890	6 ·5-inch M.Gs.
Grumman Hellcat.	Single-engine single-seat fighter.	42 10	33 4	11 3	334	..	12,366	Pratt and Whitney or Wright.	18-cyl. Radial. Double row	2,000	..	..	385	18,800	37,000	1,500	..	2,820	6 ·5-inch M.Gs.
Fairey Swordfish.	Single-engine 2/3-seat torpedo-spotter reconnaissance biplane. (wheels or floats).	45 6	Land 35 8 Sea 40 6	Land 12 4 Sea 14 7	549	Land 4,700 Sea 5,300	Land 6,750 Sea 7,360	Bristol Pegasus 30	..	750	..	4,750	Land 144 Sea 134	5,000	19,250	720	131	1,120	Bombs, a torpedo or mine. 1 fixed Vickers gun firing through air screw arc and Lewis gun in rear cockpit.

Fairey Albacore I.	Single-engine 2/3-seat torpedo-bomber reconnaissance biplane (wheels or floats).	50 0	Land 39 10 Sea 42 5	Land 14 9 Sea 17 9	623	7,250	10,460	Bristol Taurus XII.	14-cyl. sleeve-valve air-cooled radial.	1,130	..	3,500	161	4,500	18,800	930	..	..	2 Vickers ·303 M.Gs. free. 1 Browning fixed. 1 torpedo.
Vickers-Armstrongs Walrus II.	Single-engine fleet spotter. Amphibian.	45 10	37 7	15 3	610	4,900	7,200	Bristol Pegasus VI.	9-cyl. air-cooled radial.	840	..	1,280	124 185	Sea level 4,750	16,800	338	..	1,150	2 M.Gs.
Vickers-Armstrongs Seafire.	Single-engine single-seat fighter.	36 10	20 11	11 5	242	..	8,000	Rolls-Royce Merlin 45.	12-cyl. V liquid-cooled in line.	1,150	..	17,000	400	19,500	35,000	..	..	..	2 20-mm. cannon and 4 ·303-in. Browning M.Gs.
Vickers-Armstrongs Seafire III.	Single-engine single-seat fighter.	36 10	30 0	13 6	..	6,145	7,335	Rolls-Royce Merlin LXI.	12 cyl. V liquid-cooled in line.	1,185	..	..	351	10,500	35,600	..	..	..	2 20-mm. cannon. 4 ·303 Browning M.Gs.
Grumman Avenger.	Single-engine 3-seat torpedo monoplane.	54 2	40 0	16 5	490	10,555	14,500	Wright Cyclone 14.	Double row radial air-cooled.	1,700	..	..	257	12,000	20,900	1,000	..	..	2 free ·5-inch Browning M.Gs. 1 fixed. 1 22-in. torpedo.
Vought Sikorsky Kingfisher.	Single-engine 2-seat obs. scout (wheels or single float).	35 11	33 10	15 2	262	3,335	4,980	Pratt & Whitney Wasp Junior.	Radial.	450	..	5,000	170	5,500	13,000	1,000	164	..	2 ·30 machine guns. 2 100-lb. bombs.
Curtiss-Wright Seamew.	Single-engine 2-seat obs. scout (wheels or floats).	38 0	Sea 36 10 Land 34 2	Sea 15 0 Land 11 5	290	..	5,730	Ranger V–770–6.	12 cyl. inverted V air-cooled.	520	..	..	190	..	..	..	..	..	..
Fairey Barracuda	Single-engine 3-seat torpedo monoplane.	49 2	40 6	15 5	367	9,750	13,025	Rolls-Royce Merlin XXXII.	12-cyl. liquid-cooled in line.	..	..	..	..	..	22,800	500	..	..	2 ·303 Vickers guns. 1 18-in. torpedo or 6 bombs.

NAVAL AIRCRAFT.—BRITISH—*continued*.

Name	Type	Dimensions				Weight		Engine					Performance						Armament
		Span	Length	Height	Wing area	Empty	Loaded	Name	Type	B.H.P. at speed at Ht.			Speed at Ht.		Service ceiling	Range		Initial climb	
		ft. in.	ft. in.	ft. in.	sq. ft.	lb.	lb.			B.H.P.	R.P.M.	ft.	M.P.H.	ft.		Miles.	Speed at M.P.H.	Ft./ min.	
Fairey firefly I.	Low-winged, single-engine 2-seat fighter reconnaissance monoplane.	44 6	37 0	13 7	..	..	10,927	Rolls-Royce Griffon II.	12-cyl. liquid-cooled, upright V in line.	2,000	..	..	362	20,500	33,000	693	..	..	4 20-mm. cannon.
Vickers-Armstrongs Sea Otter I.	Single-engine, 3/4-seat spotter reconnaissance general purpose amphibian biplane.	46 0	39 4	15 3	610 (main plane)	..	Abt. 9,000	Bristol Mercury 30.	..	965	..	..	163	..	17,000	690	..	..	Bombs or depth charges. 3 Vickers ·303 " K " gun.

NAVAL AIRCRAFT.—UNITED STATES OF AMERICA.

Name	Type	Dimensions				Weight		Engine					Performance						Armament
		Span	Length	Height	Wing area	Empty	Loaded	Name	Type	B.H.P. at speed at Ht.			Speed at Ht.		Service ceiling	Range		Initial climb	
		ft. in.	ft. in.	ft. in.	sq. ft.	lb.	lb.			B.H.P.	R.P.M.	ft.	M.P.H.	ft.		Miles at	Speed, M.P.H.	Ft./ min.	
Grumman Avenger. TBF–1.	Single-engine 2/3 seat torpedo bomber.	54 2	41 0	13 9	490	..	16,000	Wright Double Cyclone. R–2600–0.	Air-cooled radial.	1,700	..	..	260	7,500	Above 22,600	900	153	..	1 22-in. torpedo.
Grumman Wildcat. F4F–4.	Single-engine single-seat fighter.	38 0	28 10	9 1	260	5,895	7,975	Wright Cyclone R–1830	Air-cooled radial.	1,200	..	13,500	320	18,800	34,000	1,000	..	..	6 ·50-in. M.Gs.
Douglas Dauntless. SBD–3 (5).	Single-engine 2-seat scout-bomber.	41 6	32 2	12 3	325	6,533	10,408	Wright Cyclone R–1820-60.	9-cyl. air-cooled radial.	1,200	..	5,000	255	14,000	24,300	1,000	..	1,780	Two ·50-in. M.Gs. firing forward. 2 ·30 M.Gs. 1 500-lb. bomb and smaller ones.
Brewster Buccaneer. SB2A–2.	Single-engine 2-seat scout dive-bomber.	47 0	39 6	15 7	..	7,490	12,256	Wright Double Row Cyclone GR–2600	Radial.	1,600	..	..	284	12,000	23,000	695	..	2,500	4 ·5-in. guns in wings and 2 in fuselage. 2 ·3-in. swivelling guns on fuselage. 2 500-lb. and 1 1,000-lb. bomb.
Grumman Hellcat. F6F.	Single-engine single-seat fighter.	42 10	33 7	11 2	334	..	9,000	Pratt & Whitney or Wright	Double row radial.	2,100	..	..	385	18,800	37,800	1,500	..	..	6 ·5-in. M.Gs.

NAVAL AIRCRAFT.—UNITED STATES OF AMERICA—*continued.*

Name	Type	Dimensions				Weight		Engine					Performance						Armament
		Span	Length	Height	Wing area	Empty	Loaded	Name	Type	B.H.P. at speed at Ht.			Speed at Ht.		Service ceiling	Range		Initial climb	
		ft. in.	ft. in.	ft. in.	sq. ft.	lb.	lb.			B.H.P.	R.P.M.	ft.	M.P.H.	ft.		Miles at	Speed, M.P.H.	Ft./ min.	
Vought-Sikorsky Corsair. F4U-2.	Single-engine single-seat fighter.	41 0	33 4	12 2	314	..	11,500	Pratt & Whitney Double Wasp.	Double row radial.	2,100	..	..	415	..	..	1,500	..	..	6 ·5-inch machine guns.
Curtiss Seagull. SO3C-1.	Single-engine 2-seat obs. scout (wheels or floats).	38 0	Sea 35 8 Land 34 2	Sea 16 7 Land 11 5	290	4,284	5,729	Ranger V-770-6.	12-cyl. inverted V air-cooled.	550	..	..	175	5,000	15,000	675	..	..	3 M.Gs.
Curtiss Helldiver. SB2C-1.	Single-engine 2-seat dive-bomber.	49 9	36 9	13 1	422	10,114	15,044	Wright Double-Row "Cyclone 14" GR -2600-B5.	14-cyl. air-cooled radial	1,900	..	..	280	16,600	24,700	1,000	..	..	2 20-mm. cannon or 4 ·5-in. M.Gs.
Douglas Devastator. TBD-1.	3-seat torpedo-bomber.	50 0	35 6	18 1	..	..	9,300	Pratt & Whitney Twin Wasp Junior	..	825	..	..	225	9,000	..	985	180	..	1 ·303-in. in top cowling firing through air-screw arc. 1 ·5-in.M.G. in rear cockpit, movable. Carries 1 torpedo or A.P. bomb.
Vought-Sikorsky Kingfisher OS2U-3.	Single-engine float monoplane.	35 11	33 7	14 8	261·9	3,335	4,980	Pratt & Whitney Wasp Junior.	Radial.	450	..	5,000	171	5,000	18,200	908	152	..	2 ·30 machine guns. 2 100-lb. bombs

In some instances aircraft bearing the same name in both the British and the United States navies show slight dimensional and performance differences. These are often the result of minor modifications.

NAVAL AIRCRAFT.—GERMANY AND JAPAN.

Name	Type	Dimensions				Weight		Engine					Performance						Armament
		Span	Length	Height	Wing area	Empty	Loaded	Name	Type	B.H.P. at Speed at Ht.			Speed at Ht.		Service ceiling	Range		Initial climb	
		ft. in.	ft. in.	ft. in.	sq. ft.	lb.	lb.			B.H.P.	R.P.M.	ft.	M.P.H.	ft.		Miles at	Speed M.P.H.	Ft./min.	
Mitsubishi Navy 0 Mk. 2 ZEKE 2.	Single-engine single seat fighter.	39 5	28 5	9 2	246	..	5,650	Nakajima Sakae 21	14-cyl. air-cooled radial.	1,120	..	..	341	20,500	39,900	..	..	3,020	2 20-mm. cannon in wings and 2 7·7-mm. M.Gs. in motor cowling 2 132-lb. bombs.
Mitsubishi Navy 0 Mk. 2, HAMP.	Single-engine single-seat fighter.	36 6	28 5	9 1	232	..	5,650	..	14-cyl. air-cooled radial.	1,120	..	..	348	20,000	35,900	995	188	3,580	2 20-mm. cannon in wings, 2 7·7-mm. M.Gs. in motor cowling, 2 132-lb. bombs.
Aichi T–99 Mk. 2, VAL II.	Single-engine 2-seat dive-bomber.	47 7	34 9	13′	370	..	9,007	Mitsubishi Kinsei MK–54	14-cyl. air-cooled radial.	1,000	..	..	254	13,000	29,800	874	..	1,925	2 7·7-mm. forward, 1 7·7-mm., 1078 lb. of bombs.
Arado Ar–196.	Single-engine 2-seat reconnaissance sea-plane.	41 0	36 1	14 6	307	5,500	6,600	B.M.W. 132 K.	9-cyl. air-cooled radial.	900	..	..	193	13,120	23,000	540	120	980	2 forward fixed cannon, 2 forward fired M.Gs. and one movable rear M.G. Bombs can be carried under the wings.

NAVAL AIRCRAFT.—GERMANY AND JAPAN—*continued.*

Name	Type	Dimensions				Weight		Engine					Performance						Armament
		Span	Length	Height	Wing area	Empty	Loaded	Name	Type	B.H.P. at Speed at Ht.			Speed at Ht.		Service ceiling	Range		Initial climb	
		ft. in.	ft. in.	ft. in.	sq. ft.	lb.	lb.			B.H.P.	R.P.M.	ft.	M.P.H.	ft.		Miles at	Speed M.P.H.	Ft./min.	
Heinkel He-114.	Single-engine 2-seat reconnaissance seaplane.	44 6	39 0	..	455	5,148	7,656	B.M.W. 132 N.	Air-cooled radial.	900	..	..	208	11,550	22,960	540	..	..	1 forward fixed M.G. and 1 movable rear.
Nakajima Kate 97, Mk. 3.	Single engine 2/3-seat torpedo bomber.	51 0	34 6	13 6	415	5,439	9,946	Nakajima Sakae II.	14-cyl. radial.	..	..	..	225	8,000	..	600	..	..	2 7·7-mm. M.Gs. in cowling, 1 or 2 7·7-mm. at rear of cockpit, 1 1760-lb. torpedo, or 1 1100-lb. or 3 250-lb. bombs.
Mitsubishi T 96. Mk. 2 NELL.	Twin engine 5-seat torpedo.	82 0	54 0	..	862	12,525	21,745	Kinsei 45.	14-cyl. radial.	985	..	..	241	15,000	24,000	1,870	..	1,100	1 7·7-mm. forward, 120-mm. on top, 2 7·7-mm. at side, 1 7·7-mm. underneath, 2 200-lb. bombs or 1 torpedo.
Mitsubishi 01 BETTY.	Twin-engine 5-seat torpedo.	82 0	64 6	..	821	14,450	28,780	Kasei 21.	14-cyl. radial.	1,350	..	13,500	275	14,700	28,200	..	..	..	4 7·7-mm. free, 1 20-mm. cannon, 1 18-in. torpedo or 4 550-lb. bombs.
Kawanishi 97.	Single-engine seaplane torpedo.	46 6	38 0	..	680	..	8,000	Kawanishi.	12-cyl. V liquid cooled.	650	..	7,000	155	7,000	..	450	135	..	2 fixed 7·7-M.Gs., 1 free 7·7-M.G. 1 torpedo.

Sasebo 00. PETE.	Single-engine 2-seat biplane float plane.	37 0	34 6	..	365	4,490	6,031	Mitsubishi Zuisei 13.	14-cyl. radial.	940	..	13,100	238	14,000	33,100	225	..	..	2 or 4 7·7-M.Gs. firing forward, 1 7·7 M.G. in rear cockpit.
Mitsubishi 2 RUFE	Single-engine single-seater float-plane fighter.	39 5	33 9	..	..	..	..	Nakajima Sakae.	14-cyl. radial	1,020	..	6,410	265	..	..	..	..	..	2 7·7-mm. M.Gs. 2 20-mm. Oerlikon cannon.
Watanebe Navy O JAKE II.	Single-engine reconnaissance bomber seaplane.	47 0	37 0	..	380	..	..	Mitsubishi K nse 1 44.	14-cyl. air-cooled radial.	1,000	..	..	216	7,500	..	..	..	..	3 or 4 7·7-mm. M.Gs.
Nakajima Navy 2 JILL.	Single-engine torpedo bomber.	52 0	37 0	..	..	..	10.205	Mitsubishi Kase 1 25.	14-cyl. radial.	1,540	..	..	300	16,800	26,660		..	..	3 7·7 M.Gs., 2 12·7 cannon.
Aichi Navy 2 JUDY II.	Single-engine reconnaissance dive-bomber.	37 10	33 7	..	..	..	8,610	Aichi Atsuta 21.	12-cyl. in line.	960	..	14,700	326	16,500	30,700	..	..	..	3 7·7-mm. firing forward, 1 550-lb. bomb.
Aichi PAUL II.	Single-engine reconnaissance seaplane.	42 0	35 7	..	..	..	8,360	Mitsubishi Kinsei. 54.	14-cyl. air-cooled radial.	1,080	..	..	278	19,680	..	..	..	..	1 20-mm. cannon, 1 7·7-mm. M.G. or 2 550-lb. bombs.

REFERENCE SECTION.

MISCELLANEOUS.

DIARY OF NAVAL EVENTS IN 1945.

NOTE.—***The dates given in this Diary are taken from accounts, both official and unofficial, which have been published in the Press. Dates derived from the latter cannot at present be guaranteed as accurate.***

JANUARY.

2–3.—Twenty-seven Japanese ships sunk, 68 damaged, during air attacks over Formosa and along 450 miles of Chinese coast.

3.—Allies landed at two new points on Mindoro.

4.—U.S. aircraft attacked shipping off Luzon ; 35 Japanese ships sunk or severely damaged. Akyab recaptured.

6.—Allied aircraft attacked Italian aircraft-carrier Aquila at Genoa.

7.—Announced that German auxiliary cruiser, believed to be the Kaiser, was sunk at entrance to Great Belt. Allied aircraft hit 5 ships in dry dock at Genoa, a tanker at Savona, and one other vessel at San Remo. Loss of H.M. destroyer Aldenham announced.

9.—New Allied landings on four beaches in Lingayen Gulf, Luzon ; largest operation of Philippines campaign ; 2 Japanese destroyers sunk.

11.—U.S. aircraft sank 25 Japanese ships, damaged 13, off Indo-China. Singapore bombed by U.S. aircraft based on India. British warships destroyed convoy of 7 or 8 German ships off Stavanger.

12.—R.A.F. attacked U-boat pens at Bergen with 12,000 lb. bombs.

13.—U.S. carrier-aircraft attacked Hong-Kong, Swatow, and Amoy.

17.—U.S. Navy Department announced sinking of 130 Japanese ships, damage to 260, in recent actions on China and Indo-China coasts and Formosa.

18.—U.S. submarines report sinking of 24 Japanese ships in Pacific.

19.—French warships shelled ports on Adriatic, sinking several ships.

20.—British submarines reported sinking of 84 ships and coastal craft in Far Eastern Waters. U.S. forces landed on Camotes Islands.

21.—Indian troops landed on Ramree Island.

22.—Sinking by U-boats of 6 ships and 3 corvettes in Atlantic announced.

24.—New Allied landing S.W. of Akyab.

25.—R.A.F. attacked cargo vessels in Norwegian anchorages.

26.—Indian troops landed on Cheduba Island, S.W. of Ramree.

27.—Memel captured by Russians.

30.—U.S. forces landed on Luzon between San Antonio and S. Narciso.

31.—U.S. aircraft sank Singapore floating dock.

FEBRUARY.

1.—U.S. forces landed on west coast of Batengas Province, Luzon.

4.—*Belgium liberated.*

5.—Australians landed on New Britain.

8.—Allied bombers attacked German shipping at Copenhagen and off Norwegian coast.

10.—Allied bombers attacked Tsingtao harbour.
13.—U.S. forces occupied Cavite naval base; Corregidor attacked by sea and air. Loss of U.S. escort-carrier Ommaney Bay and minesweeper in Philippine waters announced.
14.—U.S. submarines reported sinking of 31 Japanese ships in Pacific.
15.—U.S. warships attacked objectives in and near Tokyo, Iwojima, and Bonin Island. Bataan recaptured.
16.—Over 1,500 aircraft attacked Tokyo. Shipping in Bonin Islands attacked.
17.—Japanese escort-carrier wrecked, 1 destroyer, 2 destroyer-escorts, and other shipping damaged in Tokyo area during Allied sea and air attack.
19.—U.S. forces landed on Iwojima.
20.—Trieste shipyards attacked by M.A.A.F.
21.—R.A.F. attacked E-boats and other shipping off Belgian coast.
22.—U.S. marines landed on Capul Island.
23.—Turkey declared war on Axis Powers.
24.—R.A.F. attacked Hamburg. Allied aircraft attacked Rangoon and Singapore. Occupation of Manila completed.
28.—Allies landed on Piscopi Island, N.W. of Rhodes. U.S. forces landed on Palawan Island.

MARCH.

1.—U.S. marines captured Lubang Island, between Luzon and Mindoro.
2.—French warships destroyed armoured train and blocked tunnel on Franco-Italian frontier.
8.—U.S. forces landed at Zamboanga, in Mindanao.
12.—Australian forces landed on N.W. coast of Bougainville.
15.—American flag hoisted over Iwojima. British submarines reported sinking of 74 vessels, damage to 35, in Far Eastern waters.
17.—British warships shelled shipping at Genoa. British destroyers report sinking of 2 enemy destroyers off Corsican coast. British destroyers bombarded Siglis (N. Sumatra).
18.—U.S. forces captured Basilan Island, S. of Zamboanga.
19.—British destroyers bombarded South Andaman Island. Sinking of 15 enemy ships in Far Eastern waters by U.S. submarines announced.
20.—Two-day engagement between Allied aircraft and Japanese warship in Inland Sea.
21.—British aircraft attacked E-boats off Dutch coast. Loss of U.S. submarine Barbel announced.
26.—British destroyers sank 2 enemy ships and their escorts in Andaman Sea.
26–27.—U.S. and British warships and aircraft attacked the Ryukyu Islands.
27.—R.A.F. attacked U-boat shelters at Farge with 10-ton bombs. U.S. forces landed on Cebu.
28.—*Gdynia captured by Russians.*
29.—U.S. forces landed on Negros.

APRIL.

1.—U.S. forces landed on Okinawa (Ryukyu Islands).
4.—British destroyers attacked enemy convoy off Egersund.

6.—Japanese aircraft attacked U.S. fleet off Okinawa; 3 U.S. destroyers sunk. British warships attacked Sakishima Islands.
7.—U.S. aircraft sank Japanese battleship Yamato, 2 cruisers, 3 destroyers.
9.—British aircraft sank Admiral Scheer in Kiel harbour.
14.—French warships shelled forts at mouth of Gironde. U.S. submarines reported sinking of 15 more Japanese ships, including 2 warships.
16.—Allied aircraft attacked Swinemunde, Lutzow sunk.
18.—Allied aircraft attacked Kiel, Cuxhaven, Swinemunde, and Heligoland; repeated on 19th.
19.—U.S. aircraft attacked naval air station at Atsugi, near Tokyo.
20.—British warships shelled Subang and Kota Raja (Sumatra).
22.—Japanese aircraft attacked Allied fleets off Okinawa.
26.—Bremen surrendered.
27.—Fifth Army entered Genoa.
29.—*Surrender of German Army in Italy.*
30.—Australian forces landed on Tarakan Island and on Sadoe Island.

MAY

1.—Greek forces landed on Rhodes and Alimnia.
3.—British 2nd Army occupied Hamburg. Rangoon recaptured.
4.—British warships shelled Sakishima Islands.
7.—*Surrender of German Armed Forces signed at Rheims.*
9.—Channel Islands liberated. U.S. forces landed on Mindanao.
10.—Australian forces landed in New Guinea, east of Wewak.
11.—U.S. forces attacked Okinawa, damage to several warships.
15.—British destroyers sank Japanese cruiser in Malacca Straits.
16.—Dutch forces landed on Tarakan.
21.—U.S. aircraft sank 3 Japanese transports and 2 freighters off Formosa.
28.—First big air attack on Yokohama.

JUNE.

3.—Allied warships arrived off south coast of the Chinen peninsula.
5.—*German surrender entered into force at* 16.40 *hours.*
7.—First Allied cargo ship to use Wewak for 3 years entered port.
13.—British Admiralty announced loss of 4,280 Allied merchant ships between September, 1939, and V.E.-Day.
16.—British warships bombarded Truk.
18.—Allied forces landed 10 miles S.E. of Brunei.
19.—Australian forces landed on Menpakue.
20.—Australian forces landed at Lutong, Sarawak.
21.—Organised Japanese resistance ceased on Okinawa.
23–25.—Allied aircraft sank 44 enemy ships and river craft during attacks stretching from Borneo to the Kurile Isles.
25.—Japanese aircraft attacked Allied warships in Macassar Strait.
27–28.—U.S. aircraft sank or damaged 23 Japanese ships off Korea and the Southern Ryukyu Islands.
28.—Australian forces captured port of Kuala Belait.
30.—U.S. forces occupied Kume Island.

JULY.

1.—Australian forces landed at Balikpapan after 15-day bombardment.
2.—British submarine Trenchant sank Japanese cruiser in S.W. Pacific.
5.—Loss of U.S. submarine Trigger and destroyers William D. Porter and Twiggs announced.
8.—Damage to British aircraft carriers near Sakashima Islands announced.
10.—U.S. naval aircraft attacked Tokyo.
12.—New Allied landing near Andus, in Borneo.
14.—U.S. warships bombarded Kamaishi, 275 miles N. of Tokyo.
15.—U.S. warships shelled steel centre of Mororan, on Hokkaido.
16.—British warships shelled targets along Japanese coast 60 miles N. of Tokyo.
18.—Allied aircraft attacked Japanese warships in Tokyo Bay ; 12 ships sunk, 9 damaged.
23.—Announced that in previous 2 weeks 416 Japanese ships had been sunk or damaged. Air and sea attacks on Kure naval base and Japanese coast from Osaka to Nagoya. 20 Japanese warships hit, 84 cargo ships sunk or damaged in 2-day attack by U.S. naval aircraft.
24–26.—British warships shelled targets on W. coast of Malaya.
28.—Japanese battleships Haruna, Ise, and Hyuga, sunk or forced ashore ; cruisers Tone, Aoba, and Oyoda sunk in harbour, aircraft carrier Kaiyo damaged.
31.—Japanese aircraft carriers Amagi and Katsuraga severely damaged at Kure. Announced that Japanese losses in 21 days totalled 1,023 surface ships.

AUGUST.

1.—12 Japanese ships sunk or damaged during air attack on Nagasaki.
5.—Japanese hospital ship boarded between Timor and the Celebes, found to be carrying troops and munitions.
6.—First atomic bomb dropped on Hiroshima.
8.—Russia declared war on Japan.
9.—Second atomic bomb dropped on Nagasaki.
14.—*Japan surrendered.*
20.—Officially stated that only 49 warships left of Japanese fleet.
29.—U.S. forces began landing in Japan.
30.—British naval forces occupied Hong Kong.

SEPTEMBER.

2.—Instrument of unconditional surrender by Japan signed on board U.S.S. Missouri in Tokyo Bay.
5.—British and Indian forces landed at Singapore ; base handed over to British Navy on 7th.
12.—Japanese forces in South-East Asia surrendered to Admiral Lord Louis Mountbatten in Singapore.
16.—Japanese in Hong Kong surrendered to Admiral Harcourt.

BRITISH AND FOREIGN NAVAL ATTACHÉS.

On January 1, 1946.

British Naval Attachés Accredited to Foreign Countries.

To.	Name.	Appointed.	Headquarters.
Argentine and Uruguay	Captain the Hon. V. M. Wyndham-Quin, R.N.	Jan., 1945	Buenos Aires
	Assistant, Commander (S.) Lloyd-Hirst, R.N.	April, 1940	„
Brazil	Captain H. A. Simpson, O.B.E., D.S.C., R.N.	Dec., 1944	Rio de Janeiro
	Assistant, Commander C. H. Pullen, R.N.V.R.	Oct., 1939	„
Chile and Peru . . .	Captain A. C. W. Domvile, R.N.	May, 1940	Santiago
	Assistant, Commander F. V. Vaughan, R.N.V.R.	Aug., 1939	„
China	Captain E. W. Billyard-Leake, D.S.O., R.N.	Aug., 1944	Chungking
France	Rear-Admiral R. Shelley	March, 1945	Paris
	Assistants, Captain E. L. Wharton, R.N.	March, 1945	„
	Commander (E.) E. Read, R.N.	Feb., 1946	„
Netherlands	Captain R. E. Jeffreys, R.N.	Dec., 1945	The Hague
Portugal	Rear-Admiral F. C. Bradley	March, 1944	Lisbon
	Assistant, Lieutenant F. B. Stilwell, R.N.V.R.	Sept., 1943	„
Spain	Captain M. H. Scott, R.N.	May, 1944	Madrid
	Assistant, Commander S. A. Gomez-Beare, R.N.V.R.	Nov., 1940	„
Turkey	Rear-Admiral W. L. Jackson, D.S.O.	Jan., 1942	Ankara
	Assistants, Commander (E.) E. L. Tewkesbury	Sept., 1944	„
	Lieutenant-Commander G. B. Mares, R.N.V.R.	April, 1940	Istanbul
U.S.A., Panama, Cuba, Mexico, Guatamala, Honduras, Nicaragua, Costa Rica and Salvador.	Captain E. M. C. Abel-Smith, R.N.	Sept., 1944	Washington
	Assistant, Captain (E.) L. E. Rebbeck, R.N.	Feb., 1943	„
(Above countries except Panama and Cuba.)	Assistant, Lieutenant P. H. B. Otway-Smithers, R.N.V.R.	Nov., 1940	Mexico City
Venezuela, Colombia, Ecuador, Hayti, and Dominican Republic.	Rear-Admiral H. Boyes, C.M.G. C.I.E., R.N.	Dec., 1942	Bogota
Yugoslavia	Captain A. E. P. Welman, D.S.C.	March, 1945	Belgrade

Foreign Naval Attachés Accredited to Great Britain.

Argentine : Captain Teodoro E. Harting.
Belgium : Lieutenant-Colonel André Bigwood (Military Attaché).
Brazil : Vice-Admiral Alfredo Carlos Soares Dutra.
Chile : Captain Señor Don Roberto Guillmore.
China : Captain Soong Ngo (Chinese Navy). Assistant Naval Arraché : Commander Ch'en Hsun-yin.
France : Rear-Admiral L. M. P. A. Sala, D.S.O.
Greece : Captain E. Georgacopoulos, R.H.N.
Mexico : Señor Teniente de Fragata Alfredo Marquez Ricano.
Netherlands : Captain J. B. de Meester.
Peru : Post vacant.
Portugal : Commander Jose Conceicao da Rocha.
Spain : Lieutenant-Commander Don Mariano Urzaiz, Duke of Luna.
Turkey : Captain Aziz Ulusan.
United States of America : Rear-Admiral Spenser Lewis, U.S.N.
Uruguay : Post vacant.
Yugoslavia : Lieutenant-Colonel Vangel Cukalevski.

BRITISH AND FOREIGN NAVIES.

PRINCIPAL OFFICIALS.

On March 31, 1946.

GREAT BRITAIN.

Board of Admiralty.

First Lord—The Right Honourable A. V. Alexander, C.H., M.P.

First Sea Lord and Chief of Naval Staff.—Admiral of the Fleet the Right Honourable the Viscount Cunningham of Hyndhope, K.T., G.C.B., D.S.O.

Deputy First Sea Lord.—Admiral Sir Charles E. Kennedy-Purvis, G.B.E., K.C.B.

Second Sea Lord and Chief of Naval Personnel.—Vice-Admiral Sir Arthur J. Power, G.B.E., K.C.B., C.V.O.

Third Sea Lord and Controller.—Rear-Admiral C. S. Daniel, C.B., C.B.E., D.S.O.

Fourth Sea Lord and Chief of Supplies and Transport.—Vice-Admiral Sir Douglas B. Fisher, K.B.E., B.C.

Fifth Sea Lord and Chief of Naval Air Equipment.—Rear-Admiral Sir Thomas H. Troubridge, K.C.B., D.S.O.

Vice-Chief of Naval Staff.—Vice-Admiral Sir Rhoderick R. McGrigor, K.C.B., D.S.O.

Parliamentary and Financial Secretary.—John Dugdale, M.P.

Civil Lord.—W. J. Edwards, M.P.

FOREIGN POWERS.

Country.	Minister of Marine.	Chief of Staff.
Argentina . .	Rear-Admiral Abelard Pantin	Rear-Admiral Carlos M. Sculrano
Brazil . . .	Vice-Admiral Jarge Dodsworth Martins	Vice-Admiral Jose Maria Neiva
Bulgaria . .	Major-General Velcheff (Minister of War)	—
Chile . . .	Rear-Admiral Immanuel Holgar	—
China . . .	*Rear-Admiral Chow Hsien-chang	—
Columbia . .	Lt.-Cdr. Aureliane Castro (Director-General of Navy)	—
Cuba . . .	Señor Menendez Villock	Rear-Admiral S. Aguila Ruiz
Ecuador . .	—	—
France . . .	M. Michelet (Minister for the Armed Forces)	Vice-Admiral A. G. Lemonnier
	M. Tillon (Minister for Armaments)	—
Greece . . .	—	Rear-Admiral G. Mezeviris
Hungary . .	—	—
Italy . . .	Admiral de Courten	Admiral de Courten
Mexico . . .	General Java	Rear-Admiral Rodriguez Malpica
Netherlands .	Mr. J. M. de Booy	Vice-Admiral J. W. Termijtelen
Peru	Rear-Admiral Enrique Labarthe	Admiral Bravo Arenas
Portugal . .	Captain Americo Tomaz	Vice-Admiral Antonio Garcia de Sousa Ventura (Major-General of Armada) Rear-Admiral Correia Pereira (Chief of Naval Staff)
Roumania . .	Admiral Barbuneanu	—
Spain . . .	Rear-Admiral Regalado Rodriguez	Admiral A. Arriaga Adam
Turkey . . .	Rear-Admiral Cevat Ulmen	Commodore Sadik Altincan
United States of America .	James V. Forrestal (Secretary of the Navy)	Fleet-Admiral Chester W. Nimitz (Chief of Naval Operations)
Uruguay . .	Rear-Admiral Gustavo Schroeder	Captain Juan Battione
Venezuela	—	—
Yugoslavia . .	Marshal Tito (Minister of National Defence)	Major-General Cerni

* The Ministry of Marine is now merely a branch of the Military Affairs Commission with a Deputy in charge of Naval Affairs.

STATEMENT RELATING TO DEFENCE.

February 1946. (Cd. 6743)

I.—Introduction.

It is the intention of His Majesty's Government to restore the pre-war practice of laying before Parliament from time to time a White Paper on Defence Policy. During the six years of war there has been a great development in the machinery for the centralised study and control of military affairs in their widest sense, without which the successful conduct of world-wide operations, and the mobilisation of national resources for a common purpose, could not have been achieved. His Majesty's Government intend to consolidate and extend this development, so that the broad policy governing the size and composition of our defence forces, the progress of research and development, and the production of military equipment and stores, can be formulated and presented to Parliament as a co-ordinated whole. The present Paper is the first of the post-war series. It describes the policy which His Majesty's Government intend to pursue during the year 1946, which has had to be framed amid the uncertainties inevitable in the wake of a great war. For a true understanding of this policy it is necessary to survey the trend of events since the end of the German war, and the situation which faces us at the present time.

II.—1945 in Retrospect.

2. The collapse of Germany found us with our armed forces at their peak strength. About 5,100,000 men and women were deployed in Europe, the Mediterranean, and the Far East, and on the oceans of the world. Behind the forces stood men and women producing equipment and supplies for the forces, who totalled at the same date approximately 3,900,000. A grand total of 9,000,000 men and women from the British Isles were thus in the forces or were directly supplying their needs. We were confronted with three tasks. First, to re-deploy as quickly as possible all the forces that could be brought to bear against Japan. Secondly, to carry out our share of the occupation of the countries of our defeated enemies, and of the rehabilitation of Europe. Thirdly, to withdraw into civilian industry as quickly as possible those men and women not required for our first two tasks. Outline plans for all this had been prepared in anticipation of Germany's defeat, and were immediately put into effect, and redeployment was in full swing when, three months later, Japan in her turn surrendered.

3. The end of the Japanese war cut short this process of redeployment, but confronted us with formidable problems in the collection and return of our prisoners in Japanese hands, in the rounding up of the powerful Japanese forces distributed in the greatly extended area for which the Supreme Commander, South-East Asia Command, had recently become responsible, and in the task of rehabilitating the ravaged territories of the Far East. At the same time the termination of Lend-Lease added greatly to the urgency of restoring the balance of our economic life. In this situation His Majesty's Government set on foot an immediate assessment

of the many conflicting demands upon our man-power, so that a rapid and orderly redistribution could be started without delay. For the purposes of this assessment two dates were chosen, December 31, 1945, and June 30, 1946. The machinery developed in wartime for squeezing out all non-warlike effort, so that the maximum could be applied against the enemy, was put into reverse. His Majesty's Government were confronted with a direct conflict of requirements. On the one hand, we could not abandon our responsibilities in many parts of the world. To do so would have been to throw away the fruits of victory, and to betray those who had fought and died in the common cause. On the other hand, the necessity for our economic rehabilitation was imperative. There were, however, certain factors which placed unavoidable limitations upon our freedom of choice.

4. His Majesty's Government were determined to maintain in its integrity the demobilisation plan which had been drawn up by the Coalition Government and which was acknowledged on all sides to be equitable. The principle of release by age and service could not be set aside, nor could preference be given to those who happened to be serving at home. The rate at which release could take place was thus determined by the rate at which men and women could be brought home from overseas. This in turn depended upon the means of transportation. In October, 1945, a target was set for the demobilisation of 1½ million men and women by December 31, 1945—a target which was well outside anything thought possible at the time by the transportation authorities. Simultaneously, a target of 1,400,000 for the strength of men and women making supplies and equipment for the forces was set for the same date. If these two targets could be achieved, a reduction in six months of 3,740,000 or 42 per cent. in the man-power engaged in warlike activities would result. In the event, the reduction in the forces was achieved; the numbers reported as employed on the manufacture of equipment and supplies for the forces were above the target, but the figure is probably an overstatement owing to the failure or inability of some employers to distinguish between work for the forces and work for export and civilian use over which control is still exercised by Supply Departments.

5. The assessment made in October, on the best information available at that time, showed that we should have to retain in the forces on June 30, 1946, 2,233,000 trained men and women. This figure, which was announced on October 3, 1945, was accepted by His Majesty's Government for the time being, subject to review at the end of 1945. To alter the figure would have been unprofitable because the rate of release up to the end of 1945 was not affected by it. As already explained, this release was governed by physical facts. The fixing of a figure for June, 1946, however, enabled the civil industries to make their provisional plans for expansion.

III.—The Present Situation.

6. The months of December, January and February have been spent in an exhaustive review of the situation, so that a firm policy for the year 1946 can be enunciated as a guide to all concerned. This is not the time to come to decisions about the eventual shape of our post-war forces. The great strides made in the realm of science and technology, including

the production of atomic bombs, cannot fail to affect the make-up of our forces. Time is wanted for the full effects of these startling developments to be assessed. But in the meanwhile, and for the year 1946, the question of fundamental reorganisation does not arise. The tasks which confront our armed forces, and to which further reference is made below, are the tasks of resettlement and pacification—tasks which must be fulfilled to the accompaniment of steady but drastic contraction.

7. It is also too early to assess the effect on our defence requirements of the establishment of the United Nations Organisation. His Majesty's Government have repeatedly expressed their intention of giving the utmost support to the United Nations Organisation in all its activities. As one of the five permanent Members of the Security Council, a special responsibility rests upon the United Kingdom in the maintenance of international peace and security. It will fall to His Majesty's Government to conclude an agreement under Article 43 of the Charter for the provision of forces, facilities, and assistance, to be on call by the Security Council, and to be at a prescribed state of readiness and in certain general locations. The preparation of this agreement will take a certain time. Close touch with the Governments of the Dominions and of India will be maintained on this subject. We feel confident that the contribution of the British Commonwealth and Empire to the maintenance of world security will be worthy of the great cause at stake.

8. On any hypothesis, the total strength of the forces which will still be required at the end of 1946 is larger than we shall permanently require, though the pattern of its distribution between the services may be different from that in which the ultimate post-war distribution will fall. We thus have time, during the period of abnormal commitments, in which to shape our long-term plans. His Majesty's Government have, therefore, concentrated upon a careful review of the forces by sea, land, and air, which will be required to meet the tasks of 1946, and of the scale of equipment to be provided for their use.

9. The commitments with which we are now confronted, and which we are bound to undertake, can be summarised as follows :—

(*a*) *The provision of a share of the forces to ensure the execution by Germany and Japan of the terms of surrender.*

The task in Germany involves the presence of adequate naval, land, and air forces to occupy effectively the British zone, and the British sector in Berlin, to carry out the disarmament and demilitarisation of Germany within our zone, to deal with prisoners of war, and to assist in the repatriation of displaced persons, and to provide striking forces in case of trouble. The size of these forces is being reduced, though they cannot be dangerously weakened, and the organisation of the Army and Air formations in Germany is being adjusted to suit the occupational role which they have to fulfil.

The task in Japan has been very largely assumed by the forces of the United States, but we are providing a small contingent which forms part of a British Commonwealth force.

(*b*) *The provision of our share of the forces for the occupation of Austria.*

It is our desire to reduce these forces as quickly as possible to very small proportions, and we are in consultation with the other three occupying Powers to this end.

(c) *The provision of forces to maintain law and order in Venezia Giulia.*

This task, which is shared with the United States, will be brought to an end when a final settlement is reached in the Peace Treaty with Italy.

(d) *The provision of forces to assist the Greek nation in its recovery.*

The policy of His Majesty's Government in Greece has been made clear to the world. British forces in Greece will remain until elections have taken place and conditions there allow of their withdrawal.

(e) *The provision of forces to enable us to carry out our responsibilities in Palestine.*

His Majesty's Government are responsible for the administration of Palestine. It is to be hoped that an equitable solution of the political issues at stake in that country will shortly be found, but in the meantime, the preservation of law and order makes heavy demands upon our resources.

(f) *The liquidation of the Japanese Occupation of Allied territories in South-East Asia.*

The task of disarming and collecting the Japanese forces scattered throughout this great area is steadily being accomplished. The civil administration of British territories is gradually being restored, and conditions are being created for an equitable settlement of the difficult political issues in the Netherlands East Indies. Much work devolves upon the armed forces, who alone have the organisation and resources required to bring order out of chaos in territories ravaged by the Japanese, but it is the hope of His Majesty's Government that in the course of the year peaceful conditions will be re-established, thus enabling the greater part of our forces to be withdrawn.

(g) *The maintenance of internal security and settled conditions throughout the Empire.*

It has already proved possible to reduce many of our garrisons to the peacetime scale.

(h) *The safeguarding of our communications and the upkeep of our bases.*

This is essential for the efficiency and mobility of our forces by sea, land, and air.

IV.—The Strength of the Forces in 1946.

10. In addition to the above, there are a number of considerations which have a bearing upon the rate at which the reduction in the size of the forces can be carried out. The object of His Majesty's Government is to secure the release from the forces of those who have borne the heat and burden of the day. For this reason the call-up of young men must continue. At the same time, care must be taken not to impair more than can be avoided the efficiency of those forces who still have active tasks to fulfil all over the world. The progressive removal of large numbers of the experienced and the skilled, which results from the age and service release scheme, places a very heavy strain upon the organisation of the Services, and a great effort is called for in the training of replacements and in the

retraining of men and women with some time still to serve, so that the gaps in active formations can be filled. The progress of demobilisation and the movement of replacements, call for a continuous and large-scale programme of transportation. To supplement our shipping resources, it has been necessary for the Navy and the Royal Air Force to carry many men to and fro as could be done with safety and without prejudice to the execution of our major responsibilities. Many aircraft carriers and large warships are employed in this way and the task is not finished. Transport Command, R.A.F., in circumstances of great difficulty, and supplemented by a part of Bomber Command, have been conveying substantial numbers, At the peak period, movement by air on the Eastern route reached the figure of 9,000 a month in each direction. Owing to the effect of the release programme on Transport Command this figure could not be maintained. As demobilisation proceeds still further the air trooping programme must inevitably be brought to a close. This factor has been fully taken into account in our demobilisation plans.

11. There are two further tasks which should be mentioned, which still make considerable calls upon our man-power. The first is minesweeping. The Royal Navy have been playing a major part in this work, which is organised on an international basis, and which is essential for the restoration of world trade. It is hoped that this commitment will be nearly liquidated by the end of 1946. The second is the task of disposing of surplus material of all kinds. A considerable amount of Lend-Lease material has had to be kept in good condition for return to the United States. Great efforts are being made to accelerate the disposal of surplus stores of all kinds, but in the meanwhile it is necessary to store and guard valuable dumps, which would otherwise be subject to deterioration and loss.

12. The tasks which have been summarised above have been carefully and fully reviewed, with the object of determining the role to be played by each Service, and the extent to which the task of one can be relieved by judicious use of the resources of the others. Financial and man-power considerations arising from the equally important claims of our economic situation inevitably impose limitations. His Majesty's Government, after weighing up all the factors, have drawn up a programme of demobilisation for 1946 which is founded upon the reasonable expectation that a number of abnormal commitments will be entirely liquidated in the course of the year, and that unforeseen events do not disturb the course of progress towards settled peace.

The total strengths of trained men in the three Services at which this programme aims are :—

On June 30, 1946	1,900,000
On December 31, 1946	1,100,000

to which fall to be added 100,000 men under training.

It must be reiterated that the achievement of these target figures depends upon the development of events and upon the successful settlement of many problems left over from the war. It will be noted that the figure for June 30, 1946, represents a reduction of 333,000 from the estimate published last October. If the figures for December are achieved, the reduction in the strength of the forces in the eighteen months from the beginning of demobilisation in June 1945 will be approximately 3,900,000 men and women, or over 75 per cent.

13. His Majesty's Government intend to continue demobilisation in accordance with the age and service release scheme and, without prejudice to any final decision which may be taken in due course about a permanent system of national service, to continue for the present the call up of young men under the National Service Act. They fully recognise, however, that it is necessary as soon as possible to fix a definite period for the length of engagement of new entrants to the forces. Much will depend upon the rate of entry of volunteers for the Regular forces, and upon the progress of events; but, as soon as the position can be more closely gauged, His Majesty's Government intend to announce that from a given date all new entrants under the National·Service Act shall be called up for a definite period, and to say what that period will be. It will then be the aim of His Majesty's Government to demobilise as rapidly as possible—though this will necessarily take some time—all those in the Services who on the given date will have served for longer than the period fixed for new entrants.

14. His Majesty's Government are also considering the measures required for the re-establishment of reserve and auxiliary forces, with which would be associated the Cadet Corps and appropriate training organisations at certain Universities.

V.—Supply of Equipment.

15. Equally important with the reduction of the size of the forces is the reduction in the man-power employed on work for the forces. His Majesty's Government have reviewed the policy for the provision of equipment in the present abnormal circumstances. They propose to be guided by the following four principles :—

(*a*) Concentration on Research. Scientific and technical progress at the present time is so rapid that safety lies far more in the maintenance of an adequate organisation for pure and applied research than in the building up of stocks of obsolescent equipment.

(*b*) Limited introduction of equipment of the most modern kind, *e.g.*, jet-propelled aircraft.

(*c*) The maximum use of accumulated stocks.

(*d*) The maintenance of a reasonable war potential.

16. It is the view of His Majesty's Government that a severe reduction in the output of weapons and equipment for the forces is essential not only in the interests of our economic recovery, but also to avoid the accumulation of obsolescent munitions. They have accordingly imposed financial and man-power ceilings on production programmes, and they have set as the man-power ceiling for December 31, 1946, a figure of 500,000 to cover Naval shipbuilding, aircraft production, and the production of weapons, stores, equipment, clothing, etc. If this ceiling is achieved, it will mean in the eighteen months since June 1945 a reduction in supply and equipment labour of 3,387,000 men and women, or 87 per cent.

17. Taking the aggregate of men and women in the Services and employed on work for the Services, the total reduction in the eighteen months during December 1946 would be 7,280,000 or 81 per cent.

VI.—FINANCE.

18. The financial provision required for the Service Departments and the Ministry of Supply in 1946 reflects the transitional nature of the year. The rate of expenditure on the maintenance of the forces and on the production of supplies for them will steadily diminish as man-power in the forces and in the munitions industry is reduced. The total requirement for the year for these purposes will therefore be considerably higher than the level to which it will have been reduced at the end of the year. The expenditure in the year will be further swollen by the large terminal charges which are an inescapable accompaniment of the cutting down of commitments. There are war gratuities and other payments to be made at the end of service. There are charges on the termination of contracts and payments for the winding up of closed contracts. Besides these items, there is compensation for damage on the termination of requisitions of land and property. All these payments conceal the true figure at which current service and supply expenditure is actually being incurred on the day to day running of the Services.

19. The total provision included in the Estimates is as follows :—

	£ million
Navy	255
Army	682
Air	256
Supply and Aircraft Production	474
	£1,667 m.

Of this sum, the terminal charges mentioned in the preceding paragraph amount to £576 million, leaving a sum of £1,091 million as the amount required for current service and supply expenditure on the day-to-day running of the services.

20. This latter sum is distributed between broad categories of expenditure as follows, in round figures :—

	£ million
Pay, rations, etc., of Service personnel	580
Production	230
Works (including maintenance)	75
Non-effective charges	25
Miscellaneous (net)	811
	£1,091 m.

VII.—HIGHER DEFENCE ORGANISATION.

21. Reference has already been made to the development which has taken place during the war in the central machinery for the control of our war effort. The assumption by the late Prime Minister of the position of Minister of Defence, and the operation of Joint Staffs in an expanding field of activity, were the principal features of this development. There was no formal change in constitutional responsibility, though under the impulse of war the rigid boundaries of departmental authority were modified in the interests of centralised control. His Majesty's Government felt it desirable, soon after the end of the war, to review the position, and to formulate proposals for a higher defence organisation, which would embody the improvements suggested by the experience of the last six years. It is hoped before long to lay before Parliament concrete proposals.

22. In the meanwhile, the full measure of co-ordination of the Services attained during the war has not been allowed to relax. Not only in the field of plans and intelligence, but in matters of general administration and in problems of man-power, the work is on a fully combined basis not only between the Services, but also between Military and Civil staffs.

VIII.—Collaboration with the Dominions in Defence.

23. During the war, collaboration with the Dominions and India has been comprehensive, continuous, and effective. The long accepted principle whereby His Majesty's Forces throughout the Empire have been trained, organised, and equipped on the same basis, proved its value in the easy and whole-hearted co-operation which took place by sea, land, and air, in all theatres of war, between men and women of many races. Behind the forces, collaboration in the field of scientific and technical development, and in the production of munitions and supplies of all kinds, was equally close and thorough. His Majesty's Government in the United Kingdom acknowledge to the full the tremendous efforts put forward in the common cause by the whole Commonwealth and Empire, and earnestly desire to continue in peace the full partnership so magnificently established in war. It will be necessary to consider with the Governments of His Majesty's Dominions and India the way in which the lessons of the war can be applied to promote consultation and collaboration in defence matters during peace.

ABSTRACT OF NAVAL ESTIMATES FOR 1946

Terminal War Charges.

The following amounts are included in Navy Estimates, 1946, in respect of the items shown :—

Votes and Subheads	*Nature of Service.*	*Estimate* £
1.A., B., E. & F., 2.H.	Pay and cash allowances of personnel of the Royal Navy and Royal Marines and of the Women's Royal Naval Service, etc., on release leave and Unemployment Insurance for personnel on release	14,800,000
1.C.	Post-war credits and war gratuities to personnel of the Royal Navy and Royal Marines and of the Women's Royal Naval Service, etc., on release	20,000,000
2.M.	Clothing allowances to members of the Women's Royal Naval Service, etc., on release	450,000
11.A.	Travelling expenses on release	350,000
	Total of Personnel Items	£35,600,000
2.G.,M.,8.IIA., K., 8.IIIA., B., 9.F., I., 10.B.	Outstanding liabilities for contracts completed or cancelled prior to March 31, 1946, etc.	28,036,000
16	Merchant shipbuilding, etc.	5,364,000
11.F.	Payments in respect of re-instatement works and compensation under the Compensation Defence Act, etc.	1,500,000
	Total Contract, etc., Items	£34,900,000
	Gross total	£70,500,000

ABSTRACT OF NAVY ESTIMATES FOR 1946

Vote.		Gross Estimate.	Appropriations in Aid.	Net Estimate.
				Maximum Numbers.
	I.—NUMBERS.			
A	Number of Officers, Seamen, Boys, and Royal Marines	490,000	—	490,000
	Number of Royal Marine Police	2,800	—	2,800
	II.—EFFECTIVE SERVICES.	£	£	£
1	Wages, etc., of Officers and Men of the Royal Navy and Royal Marines, and Women's Royal Naval Service	87,729,000	439,000	87,290,000
2	Victualling and Clothing for the Navy	26,335,800	6,700,800	19,635,000
3	Medical Establishments and Services	1,970,000	81,200	1,889,000
4	Civilians employed on Fleet Services	2,479,000	4,000	2,475,000
5	Educational Services	511,500	92,500	419,000
6	Scientific Services	4,925,000	131,000	4,794,000
7	Royal Naval Reserves	360,100	100	360,000
8	Shipbuilding, Repairs, Maintenance, etc.			
	Section I.—Personnel	23,810,900	215,900	23,595,000
	Section II.—Matériel	30,876,000	2,250,000	28,626,000
	Section III.—Contract Work	33,255,700	980,700	32,275,000
9	Naval Armaments..	10,408,000	500,000	9,908,000
10	Works, Buildings and Repairs at Home and Abroad	10,100,000	550,000	9,550,000
11	Miscellaneous Effective Services	13,310,000	1,060,000	12,250,000
12	Admiralty Office	4,951,000	10,000	4,941,000
	Total Effective Services .. .. ..£	251,022,200	13,015,200	238,007,000
	III.—NON-EFFECTIVE SERVICES.			
13	Non-Effective Services (Naval and Marine)—Officers	2,887,000	10,000	2,877,000
14	Non-Effective Services (Naval and Marine)—Men ..	6,462,000	12,000	6,450,000
15	Civil Superannuation, Allowances and Gratuities ..	2,377,400	400	2,377,000
	Total Non-Effective Services .. ..£	11,726,400	22,400	11,704,000
	IV.—MERCHANT SHIPBUILDING.			
16	Merchant Shipbuilding, etc. .. .. .. £	5,624,500	260,500	5,364,000
	Grand Total .. .. £	268,383,100	13,298,100	255,075,000

INTER-DEPARTMENTAL SERVICES.

During the war period no financial adjustment was made between the Admiralty, War Office, Air Ministry, Ministry of Supply and Ministry of Aircraft Production in respect of stores, supplies and services furnished by one Department to another. In view of the continued manpower stringency and the heavy strain on accounting staffs during the present transitional period from war to peace conditions, this waiver of inter-departmental adjustment has of necessity been extended to cover the financial year 1946. For similar reasons it will not be possible in 1946 fully to resume the pre-war practice of financial adjustment for all the services which, under normal peace-time arrangements would be rendered on a repayment basis to the Admiralty by civil departments other than the Ministry of Supply.

In addition to the items covered by the waiver of inter-departmental adjustment mentioned above, and in accordance with pre-war practice (see Navy Estimates, 1939, p. 6) certain provision is made for Naval services in Civil and Revenue Departments Estimates without repayment from Navy Funds. The Departments principally concerned are the Exchequer and Audit Department, the Ministry of Works, the Rating of Government Property Department, His Majesty's Stationery Office and the General Post Office.

Admiralty,
12th March, 1946.

A. V. ALEXANDER.
CUNNINGHAM OF HYNDHOPE.
C. E. KENNEDY-PURVIS
ARTHUR J. POWER.
C. S. DANIEL.
DOUGLAS FISHER.
T. TROUBRIDGE.
R. MCGRIGOR.
JOHN DUGDALE.
WALTER J. EDWARDS.
H. V. MARKHAM.

PICTORIAL SECTION

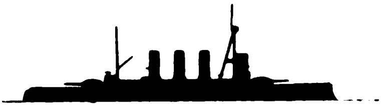
PICTORIAL SECTION

SILHOUETTES OF WARSHIPS.

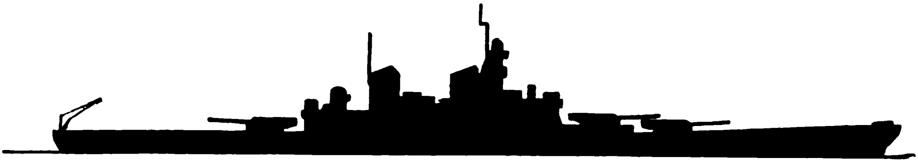
CAPITAL SHIPS.

[In order to facilitate identification, the ships are arranged in accordance **with the number of funnels and masts,** as these are the features most easily distinguished at a distance. Dimensions and particulars of British and foreign warships will be found on pp. 197–300. All the profiles are drawn to the scale ½ in. = 100 ft.]

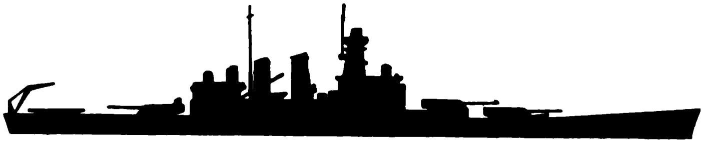
[An Index to the names of vessels of which profiles are included in this section are given at the end of the volume.]



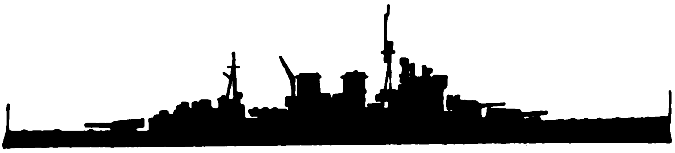
SWEDEN. Battleship. Oscar II.
Mainmast removed.



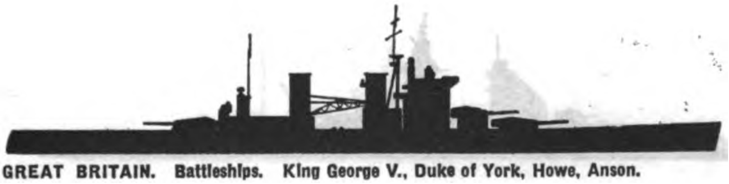
UNITED STATES. Battleships. Iowa, Missouri, New Jersey, Wisconsin, Kentucky.



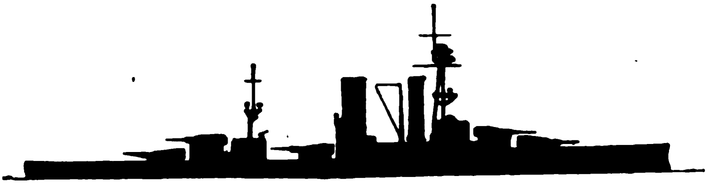
UNITED STATES. Battleships. Washington, North Carolina.



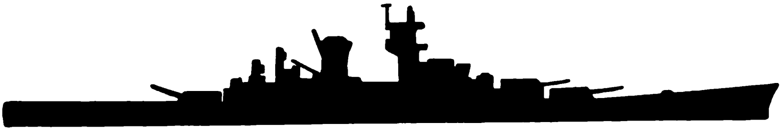
GREAT BRITAIN. Battle-cruiser. Renown.



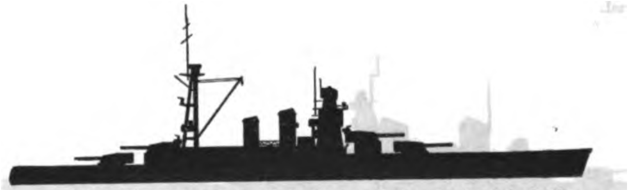
GREAT BRITAIN. Battleships. King George V., Duke of York, Howe, Anson.
Tripod mainmast.



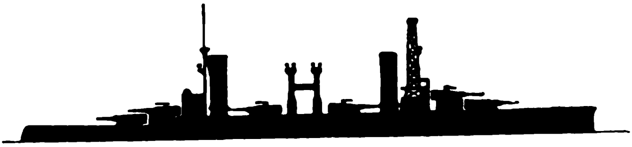
CHILE. Battleship. Almirante Latorre.
(Modernised 1931—mainmast raised and bridge work altered.)
Catapult fitted on quarter deck.



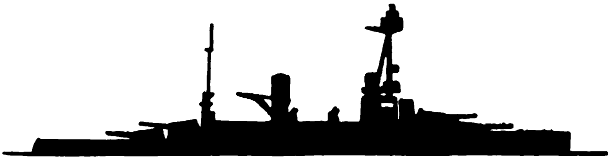
UNITED STATES. Battle-cruiser. Alaska.



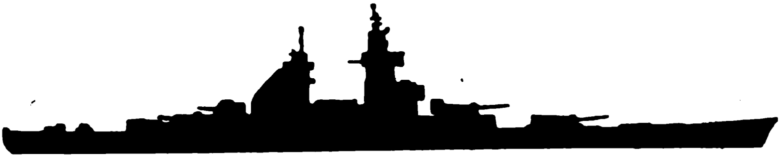
ITALY. Battleships. Giulio Cesare, Andrea Doria, Caio Duilio.
Modified bridgework and pole mainmast in Doria and Duillio.



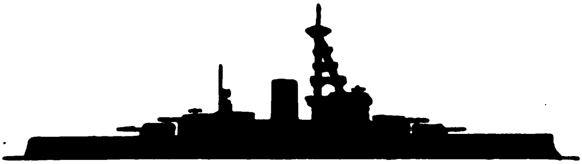
ARGENTINA. Battleships. Moreno, Rivadavia.
Guns on B and X turrets replaced by range-finders.



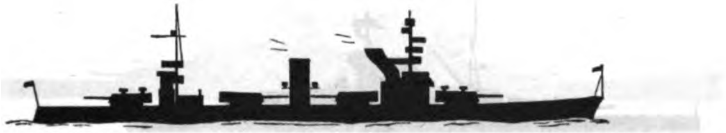
FRANCE. Battleship. Lorraine.



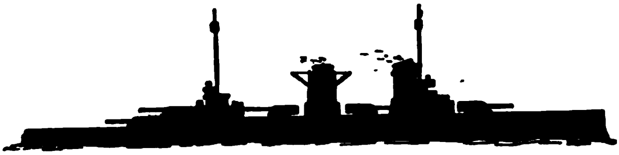
FRANCE. Battleship. Richelieu.



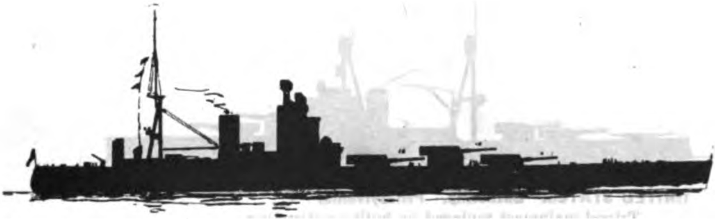
BRAZIL. Battleships. Minas Geraes, São Paulo.



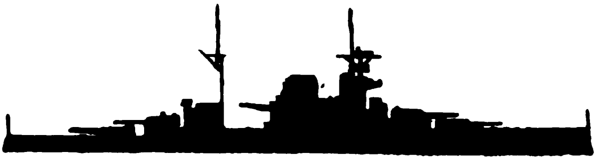
SOVIET UNION. Battleships. Marat, Paris Commune and October Revolution.
Two derricks fitted between mainmast and turret in Marat and Paris Commune.
Crane fitted abreast mainmast in October Revolution.



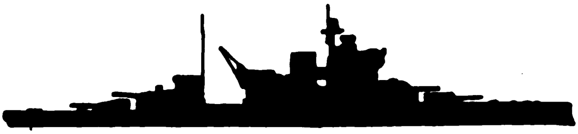
TURKEY. Battle-cruiser. Yavouz Sultan Selim.



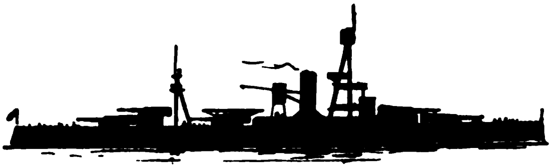
GREAT BRITAIN. Battleships. Nelson, Rodney
Mast structure increased.



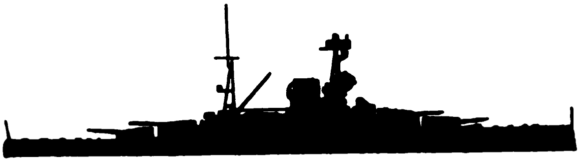
GREAT BRITAIN. Battleship. Malaya.



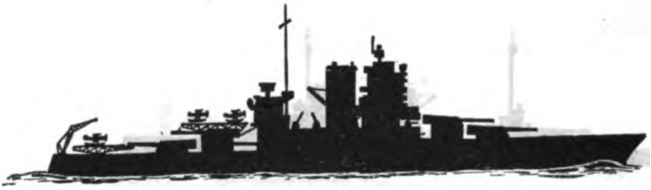
GREAT BRITAIN. Battleships. Warspite, Queen Elizabeth, Valiant.



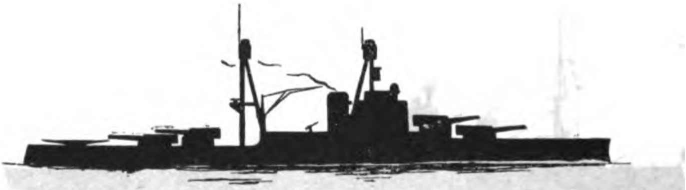
UNITED STATES. Battleships. New York, Texas.
Mastheads have been modified.



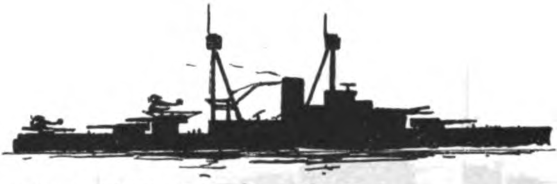
GREAT BRITAIN. Battleships. Ramillies, Resolution, Revenge,&Royal Sovereign.



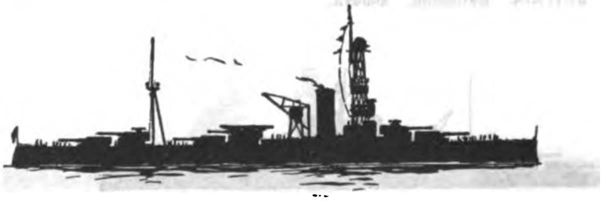
UNITED STATES. Battleships. Idaho, Mississippi, New Mexico.



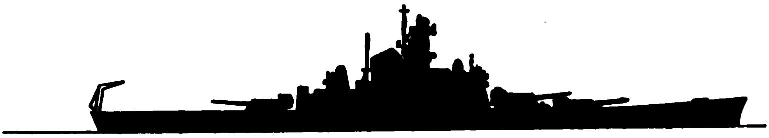
UNITED STATES. Battleship. Pennsylvania.
Tripod mainmast replaced by built up structure.



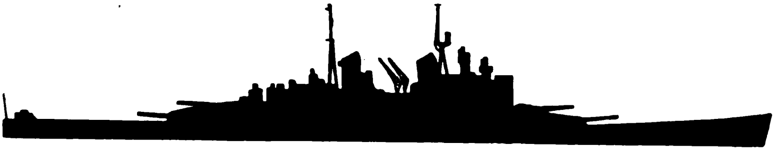
UNITED STATES. Battleship. Nevada.
Tripod mainmast removed and superstructure increased.



UNITED STATES. Battleship. Arkansas.
Foremast replaced by tripod and bridge structure increased.

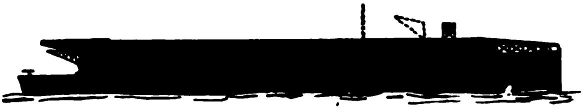


UNITED STATES. Battleships. Alabama, Indiana, Massachusetts, South Dakota.

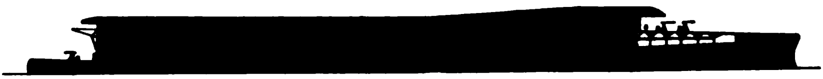


GREAT BRITAIN. Battleship. Vanguard.

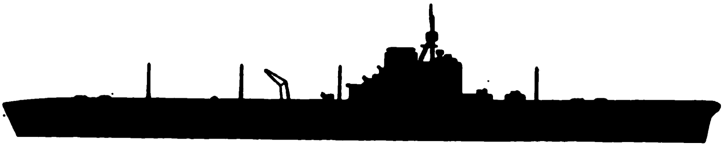
AIRCRAFT AND SEAPLANE CARRIERS AND TENDERS.



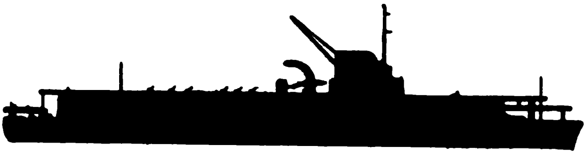
GREAT BRITAIN. Aircraft Carrier. Argus. (Training Ship.)
Flight deck levelled forward and extended aft.



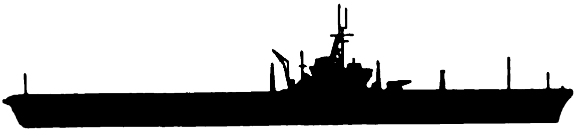
GREAT BRITAIN. Aircraft Carrier. Furious.
Three wireless masts added each side of flight deck.
Quarter deck has been raised one deck.
Deck forward has been levelled and sides blanked off.
Superstructure, polemast and spotting top fitted amidships.



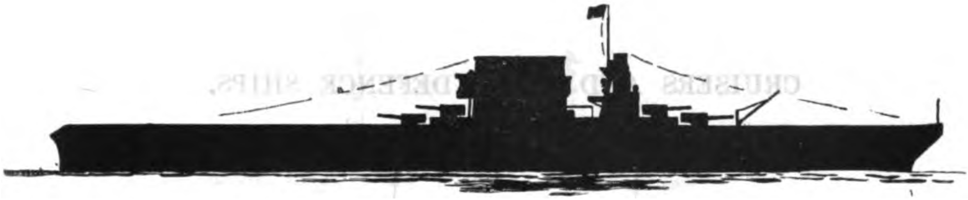
GREAT BRITAIN. Aircraft Carriers. Illustrious, Victorious, Formidable, Indomitable.



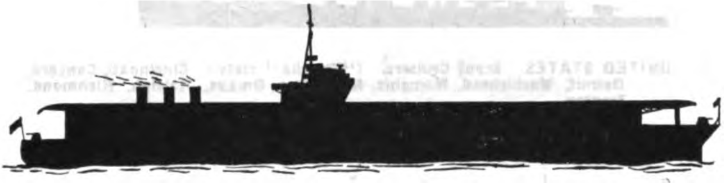
FRANCE. Aircraft Transport. Béarn.
Space between flight deck and upper deck forward partially blanked off.
Framework fitted on aft side of funnel.



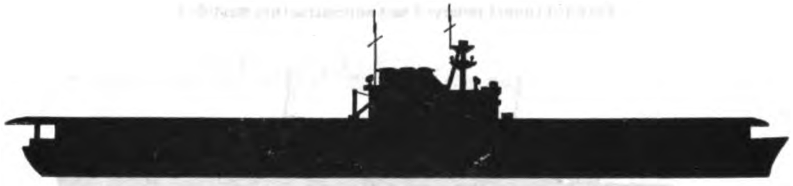
GREAT BRITAIN. Light Fleet Carrier. ("Colossus" class.)



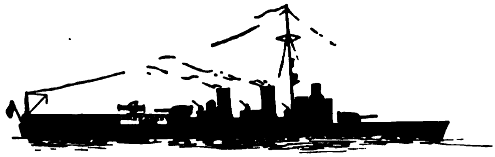
UNITED STATES. **Aircraft Carrier.** **Saratoga.**



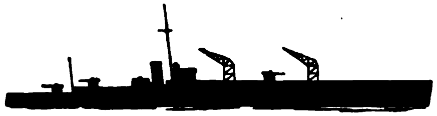
UNITED STATES. **Aircraft Carrier.** **Ranger.**
(NOTE.—Funnels hinge outboard.)



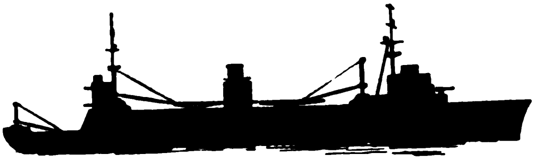
UNITED STATES. **Aircraft Carrier.** **Enterprise,**



SWEDEN. **Aircraft Cruiser.** **Gotland.**
Has been reconstructed as A.A. cruiser.

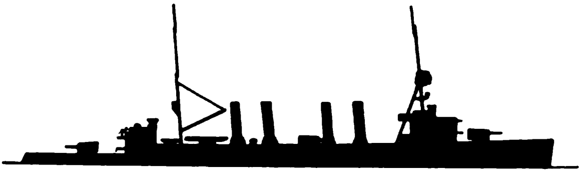


GREAT BRITAIN. **Seaplane Carrier.** **Albatross.**
Catapult fitted forward.

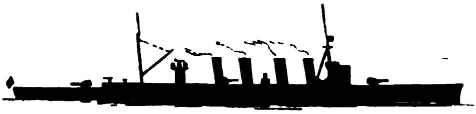


FRANCE. **Aviation Transport.** **Commandant Teste.**

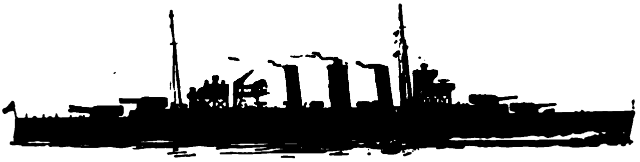
CRUISERS AND COAST DEFENCE SHIPS.



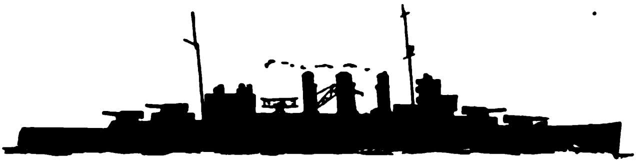
UNITED STATES. Scout Cruisers. ("Omaha" class.) Cincinnati, Concord, Detroit, Marblehead, Memphis, Milwaukee, Omaha, Raleigh, Richmond, Trenton.



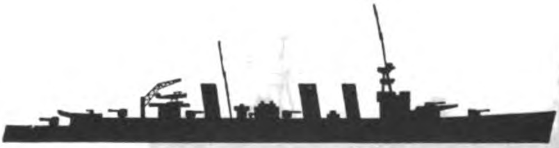
ROYAL AUSTRALIAN NAVY. Cruiser. Adelaide.
Forward funnel removed and superstructure modified.



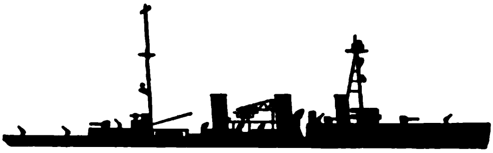
GREAT BRITAIN. Cruisers. ("London" class.) Devonshire, London, Sussex. ("Norfolk" class.) Norfolk.
Fore topgallant mast added. London extensively reconstructed (1940): 2 funnels.
ROYAL AUSTRALIAN NAVY. Cruiser. Shropshire



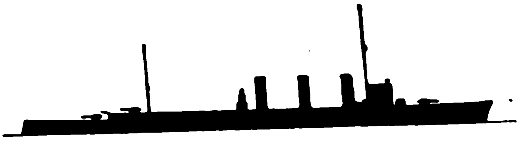
GREAT BRITAIN. Cruisers. ("Kent" class.) Cumberland, Suffolk, Kent, Berwick.
Kent and Berwick are flush-decked.
ROYAL AUSTRALIAN NAVY. Cruiser. ("Kent" class.) Australia.
No hangars fitted.



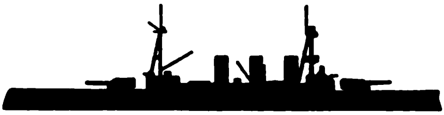
GREAT BRITAIN. Cruisers. ("E" class.) Emerald, Enterprise.
In Enterprise the forward 6-in. guns are in a twin mounting on the forecastle deck.
Aircraft arrangements removed.



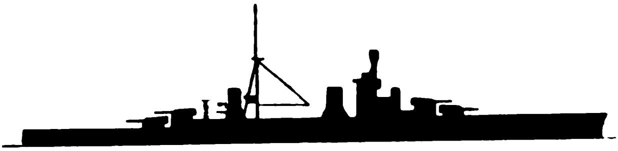
SOVIET UNION. Cruiser. Profintern. (Now Krasny Krym).



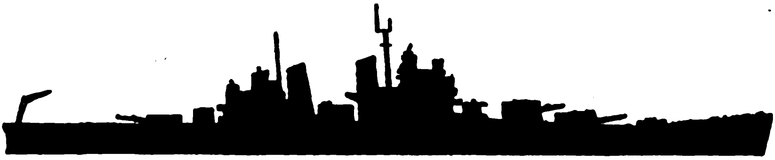
SPAIN. Light Cruiser. Mendez Nuñez.
Foremast is tripod. Fore topgallant mast added.
A.A. armament fitted between second funnel and mainmast.
Searchlight platform fitted round after funnel.



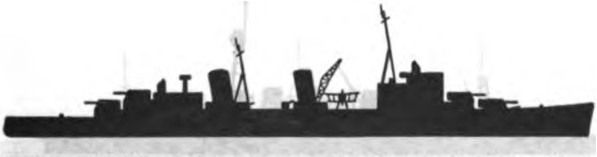
GREECE. Cruiser. Giorgios Averoff.



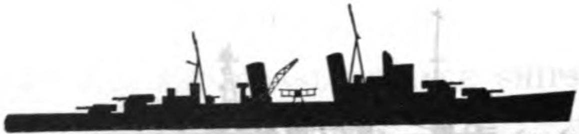
ITALY. Cruiser. ("Zara" class.) Gorizia.
Clinker screens fitted to funnels.



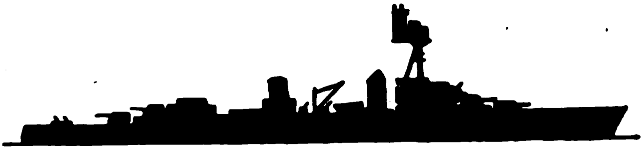
UNITED STATES. Cruisers. ("Chicago" class.)



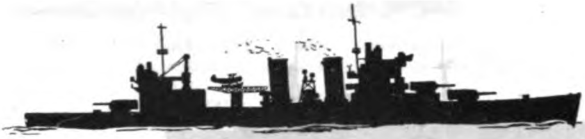
GREAT BRITAIN. Cruiser. (Improved "Southampton" class.) Belfast.
Aircraft removed.



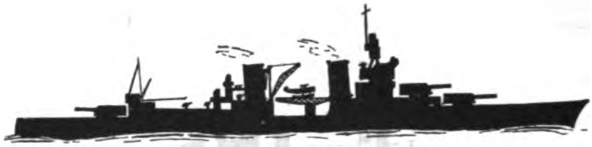
GREAT BRITAIN. Cruisers. ("Southampton" class.) **Newcastle, Sheffield, Birmingham, Glasgow, Liverpool.**
Aircraft removed.



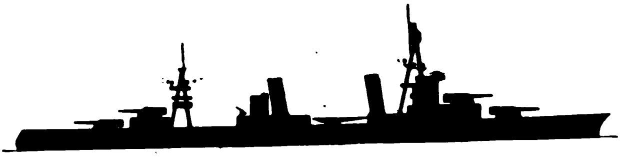
FRANCE. Cruisers. ("Duquesne" class.) **Duquesne, Tourville and Suffren.**



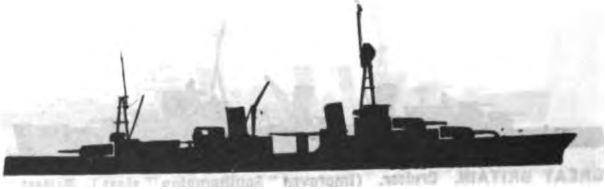
UNITED STATES. Cruisers. ("New Orleans" class.) **New Orleans, Minneapolis, San Francisco, Tuscaloosa.**



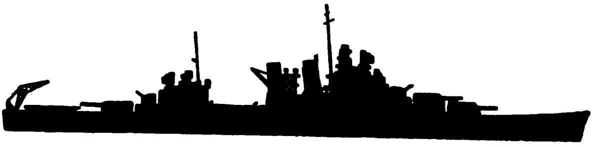
UNITED STATES. Cruisers. **Portland.**
Mainmast moved to fore side of after funnel.



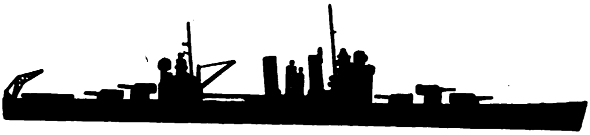
UNITED STATES. Cruisers. ("Pensacola" class.) **Salt Lake City, Pensacola.**
Crane fitted on fore side of after funnel.
Superstructure built up aft, mainmast moved forward.



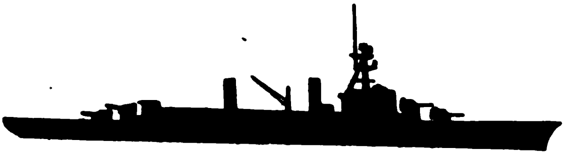
UNITED STATES. Cruisers. ("Chester" class.) **Chester, Louisville, Augusta.**



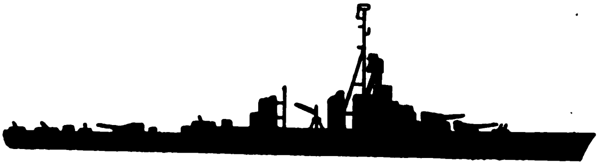
UNITED STATES. Cruiser. Wichita.



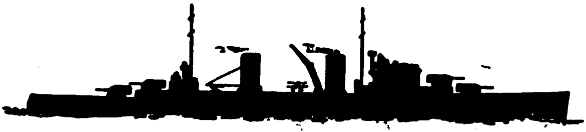
UNITED STATES. Cruisers. Boise, Brooklyn, Honolulu, Nashville, Philadelphia, Phoenix, Savannah, St. Louis.



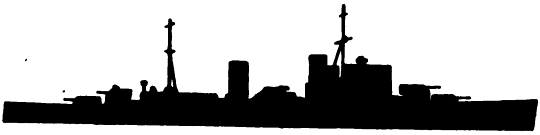
FRANCE. Training Cruiser. Jeanne d'Arc.



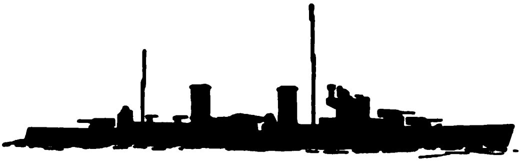
FRANCE. Cruisers. Gloire, Montcalm, Georges Leygues.



ROYAL AUSTRALIAN NAVY. Cruiser. (Modified "Leander" class.) Hobart.
Aircraft removed.

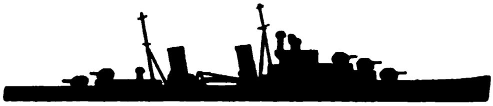


GREAT BRITAIN. Cruisers. ("Fiji" class.) Ceylon, Jamaica, Gambia, Uganda, Kenya, Mauritius, Nigeria.

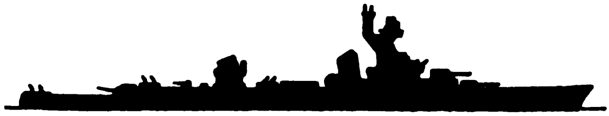


GREAT BRITAIN. Cruisers. ("Arethusa" class.) Arethusa, Penelope, Aurora.

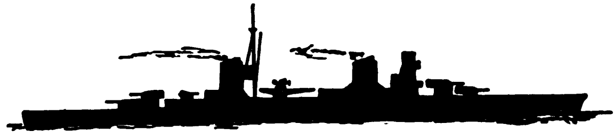
Derrick fitted on aft side of after funnel.



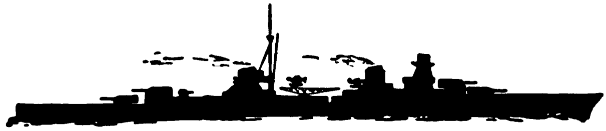
GREAT BRITAIN. Cruisers. ("Dido" class.),



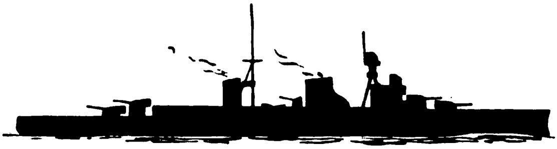
FRANCE. Cruiser Minelayer. Emilé Bertin.



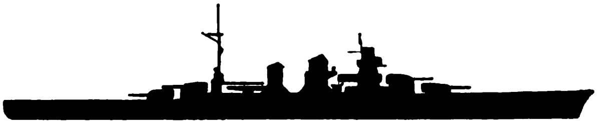
ITALY. Cruiser. Montecuccoli.



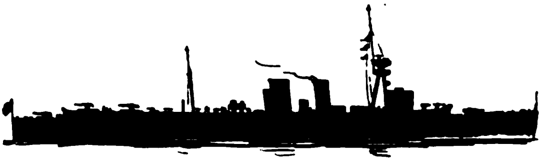
ITALY. Cruisers. ("Attendolo" class.) Eugenio di Savoia, Filiberto Duca d'Aosta.



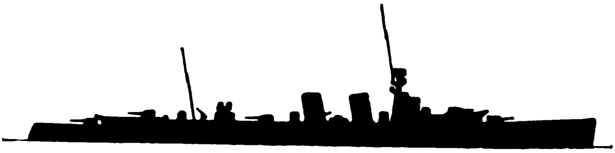
ITALY. Cruiser. Luigi Cadorna.



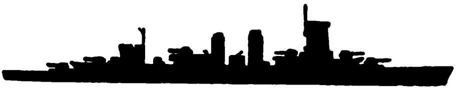
ITALY. Cruisers. Luigi di Savoia, Guiseppe Garibaldi.



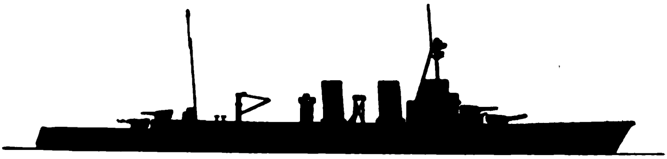
GREAT BRITAIN. Cruiser Minelayer. Adventure. (Stern has been extended.)
Derricks added abreast masts.



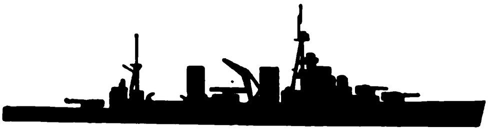
SPAIN. Cruisers. Galicia, Almirante Cervera, Miguel de Cervantes.
The mainmasts are tripods.
Fore topmast and topgallant mast removed.



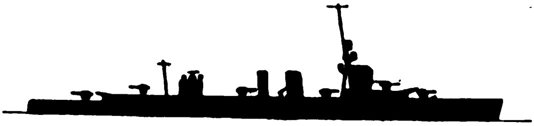
SPAIN. Cruiser. Navarra (ex-Republica).



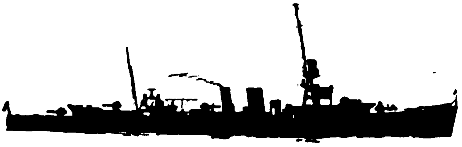
FRANCE. Cruiser. Duguay-Trouin.
Catapult fitted on quarter deck.
Fore topmast removed and mast head modified.



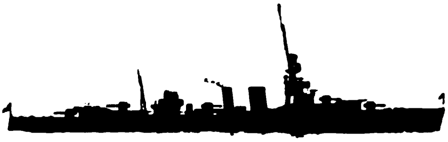
ARGENTINA. Cruiser. La Argentina.



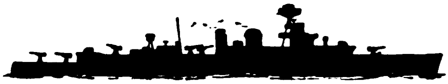
GREAT BRITAIN. Cruiser. Dauntless.
Main topmast added.



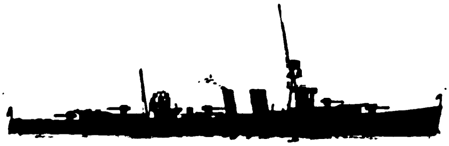
GREAT BRITAIN. Cruisers. ("D" class: repeat vessels.) Delhi, Diomede, Despatch.
Foremost gun in Diomede is housed in a gunhouse.
Topmasts removed.



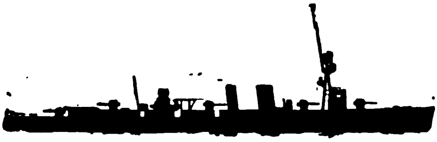
GREAT BRITAIN. Cruisers. ("Ceres" class.) Cardiff, Ceres.



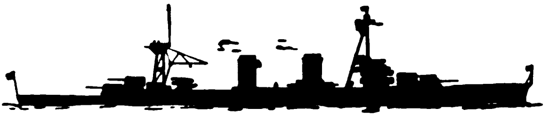
GREAT BRITAIN. Anti-Aircraft Cruisers. ("Carlisle" class.) Colombo, Capetown.
Tripod mainmast.



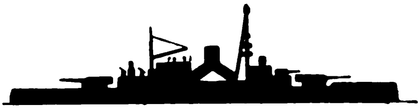
GREAT BRITAIN. Cruiser. Carlisle.
Topmast removed.



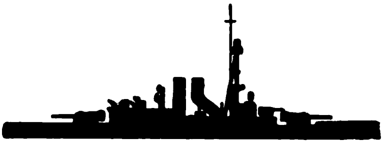
GREAT BRITAIN. Cruisers. ("Caledon" class.) Caledon, Caradoc.
Mainmast lengthened.



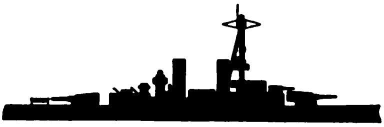
SOVIET UNION. Cruiser. Krasni Kavkaz.
Catapult fitted between mainmast and funnel.
A.A. guns fitted between funnels.



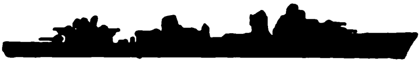
SWEDEN. Coast Defence Ship. Gustav V.
Mainmast and derrick removed.



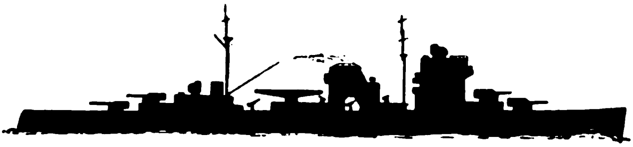
SWEDEN. Coast Defence Ship. Sverige.



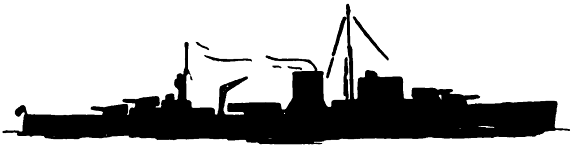
SWEDEN. Coast Defence Ship. Drottning Victoria.



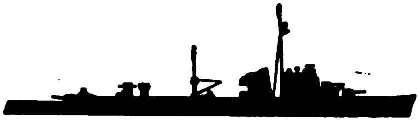
FRANCE. Light Cruiser. Le Malin class.



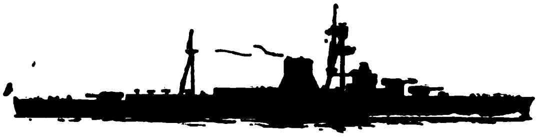
SPAIN. Cruiser. Canarias.
Masts removed.



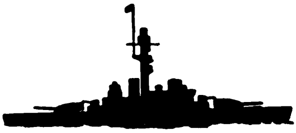
GREAT BRITAIN. Cruisers. (" Leander " class.) Leander, Achilles, Orion, Ajax.



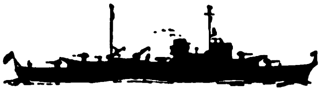
NETHERLANDS. Cruiser. Tromp.



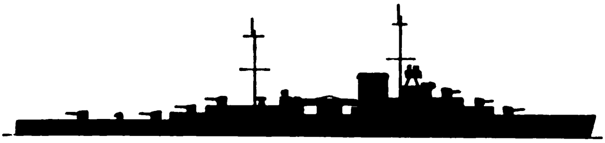
ARGENTINA. Cruisers. Almirante Brown, Vinticinco de Mayo.
Derrick fitted on fore side of mainmast.
Superstructure built on aft side of mainmast.



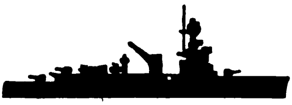
FINLAND. Armoured Gunboats. Väinämöinen, Ilmarinen.



NORWAY. Minelaying and Training Ship. Olav Trygvason.
Both cranes are fitted abreast mainmast.

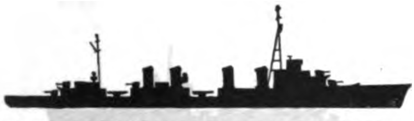


GREAT BRITAIN. Cruisers. Frobisher, Hawkins.
Second funnel added.

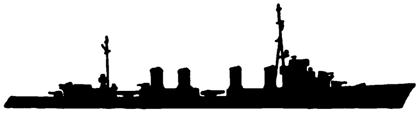


DENMARK. Cruiser. Niels Juel.

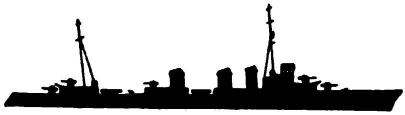
FLOTILLA LEADERS AND DESTROYERS



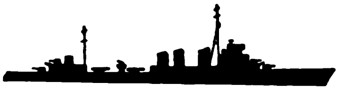
FRANCE. Flotilla Leaders. Cassard, Vauquelin, Kersaint, Tartu, Le Chevalier Paul, Aigle, Albatros, Epervier, Milan, Gerfaut, Vautour.



FRANCE. Flotilla Leaders. Guépard, Lion, Vauban, Valmy, Verdun.

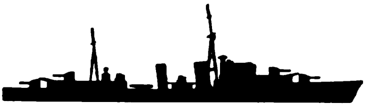


FRANCE. Flotilla Leaders. Tigre, Léopard, Lynx.
Platform added before after turrets.

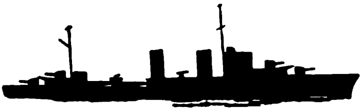


FRANCE. Destroyers. Mistral, Ouragan, Simoun, Tempête, Tramontane, Typhon, Trombe, Tornade.

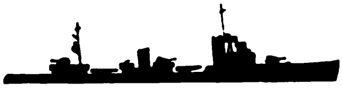
POLAND. Destroyer. Burza is similar.
Mainmast shortened.



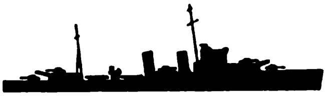
GREAT BRITAIN. Destroyers. "Tribal" class.
Pole mainmast.



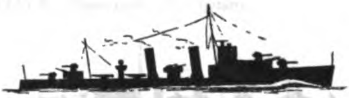
YUGO SLAVIA. Flotilla Leader. Dubrovnik.



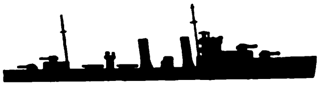
ITALY. Nicoloso da Recco.



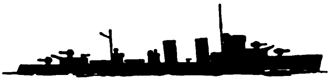
GREAT BRITAIN. Flotilla Leader. Faulknor.
Pole mainmast.



GREAT BRITAIN. Destroyers. "Acasta," "Beagle," "Crusader" and "Defender" classes.
"Acasta" and "Crusader" classes have davits at stern.

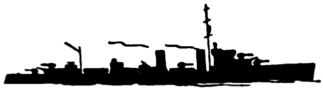


GREAT BRITAIN. Destroyers. "Greyhound," "Hero" and "Intrepid" classes.
Mainmast shortened.

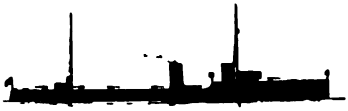


PORTUGAL. Destroyers. Vouga, Lima, Dao, Tejo, Douro.

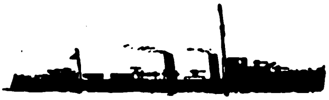
COLOMBIA. Destroyers. Antioquia, Caldas.



ARGENTINA. Flotilla Leaders. Mendoza, La Rioja, Tucuman.



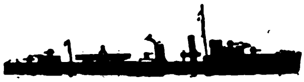
ITALY. Flotilla Leader. Augusto Riboty.



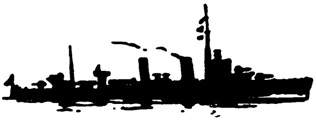
GREAT BRITAIN. Flotilla Leaders. Keppel. Douglas, Campbell, Mackay. Malcolm, Montrose.

ROYAL AUSTRALIAN NAVY. Flotilla Leader. Stuart.

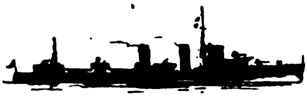
SPAIN. Flotilla Leaders. Almirante Valdes. etc., generally similar.



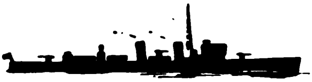
GREAT BRITAIN. Destroyers. Admiralty "V" class.



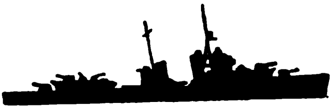
GREAT BRITAIN. Destroyers. Ambuscade. Amazon.



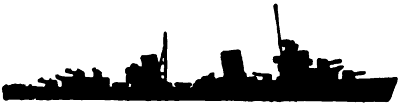
CHILE. Destroyers. Serrano, Orella, Riquelme, Hyatt, Videla, Aldea.
Mainmast heightened.



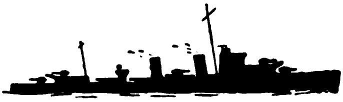
SWEDEN. Destroyers. Klas Horn, Klas Uggla, Ehrensköld, Nordenskjold.
Davit fitted at stern.



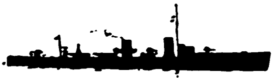
UNITED STATES. Destroyers. "Mahan" class.



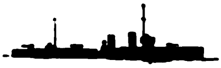
SOVIET UNION. Destroyers. "Leningrad" class.



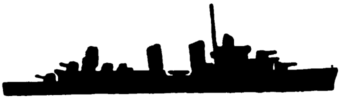
GREAT BRITAIN. Destroyers. "Eclipse" and "Fearless" classes similar but gun between funnels omitted.



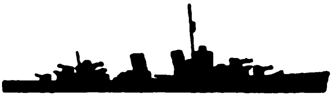
GREAT BRITAIN. Destroyers. Admiralty "S" class.



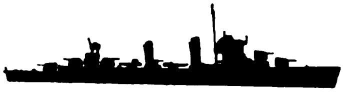
DENMARK. Torpedo Boats (1st Class). Glentin Hogen, Ornen, Laxen, Dragen, Hvalen.



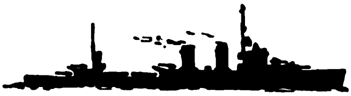
UNITED STATES. Destroyers. "Benson" class.



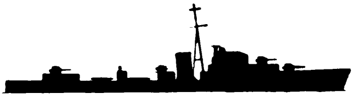
UNITED STATES. Destroyers. Dunlap, Fanning.



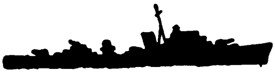
UNITED STATES. Destroyers. "Fletcher" Class.



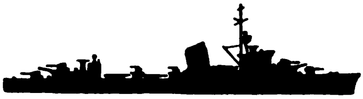
UNITED STATES. Destroyers. "Farragut" class.



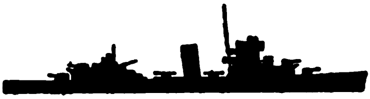
GREAT BRITAIN. Destroyers. "Javelin" and "Kelly" classes.



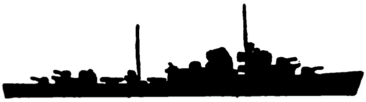
GREAT BRITAIN. Destroyers. "Hunt" class.



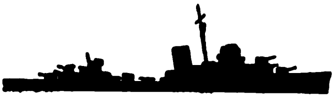
POLAND. Destroyer. Blyskawica.



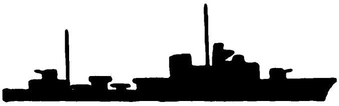
UNITED STATES. Destroyers. "Somers" class.



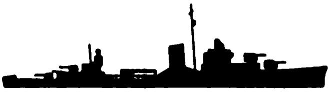
SOVIET UNION. Destroyers. "Stremitelni" class.



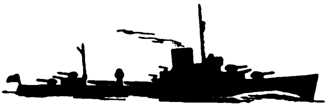
UNITED STATES. Destroyers. "Craven" class.



ITALY. Destroyer. A. Oriani.



UNITED STATES. Destroyers. "McCall" class.



GREECE. Destroyers. Spetzai and Coundouriotis.

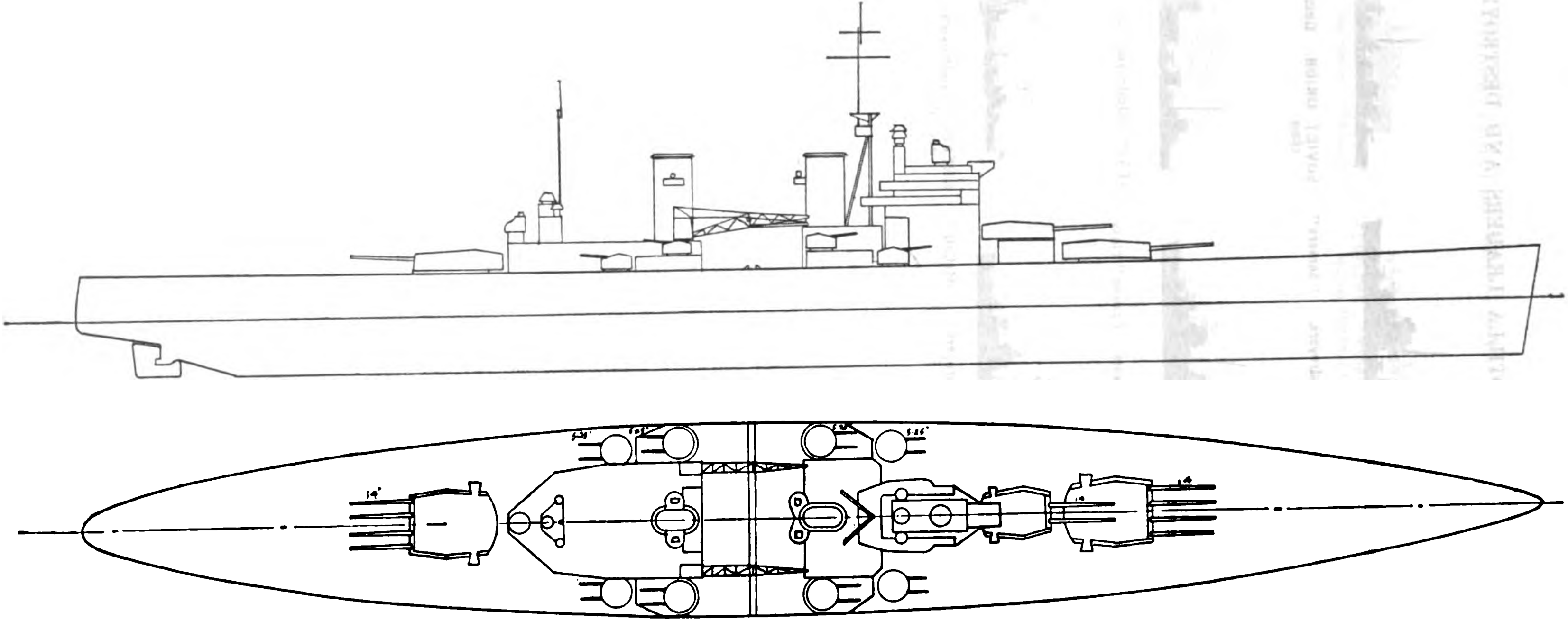
PICTORIAL SECTION

PLANS AND ELEVATIONS OF WARSHIPS.

GREAT BRITAIN.

BATTLESHIPS.

King George V.   Duke of York.   Howe.   Anson.

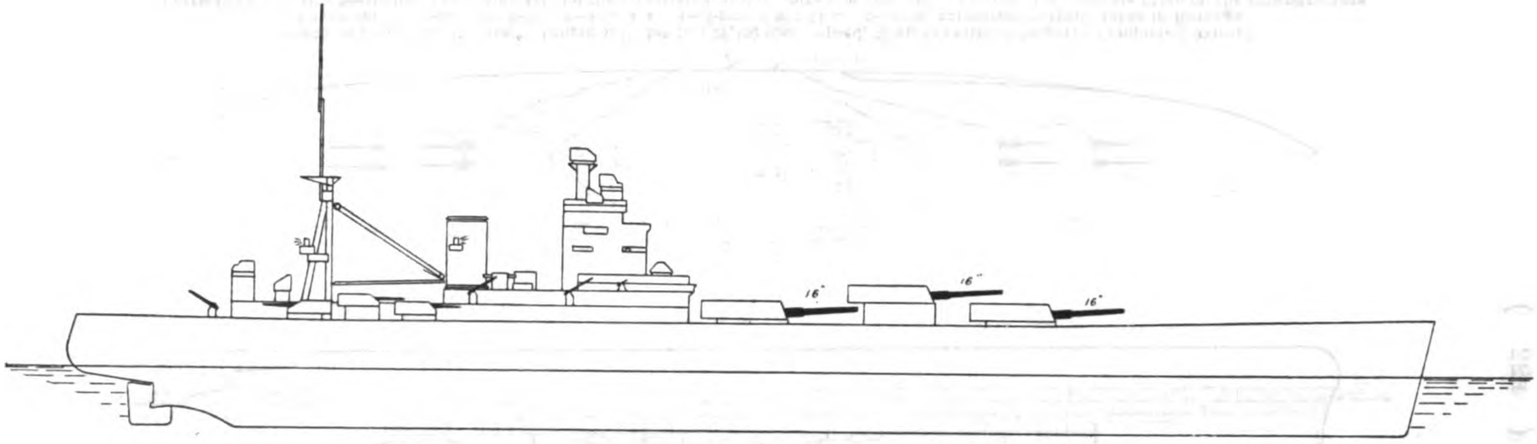


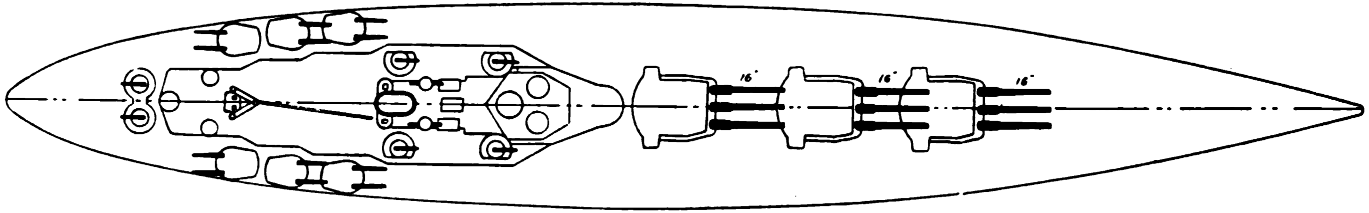
Length 745 ft.; 35,000 tons; Completed 1941–42.
Armament, 10—14-in.; 16—5·25-in; many light A.A. guns; 4 Aircraft; Catapult.

GREAT BRITAIN.

BATTLESHIPS.

Nelson. **Rodney.**





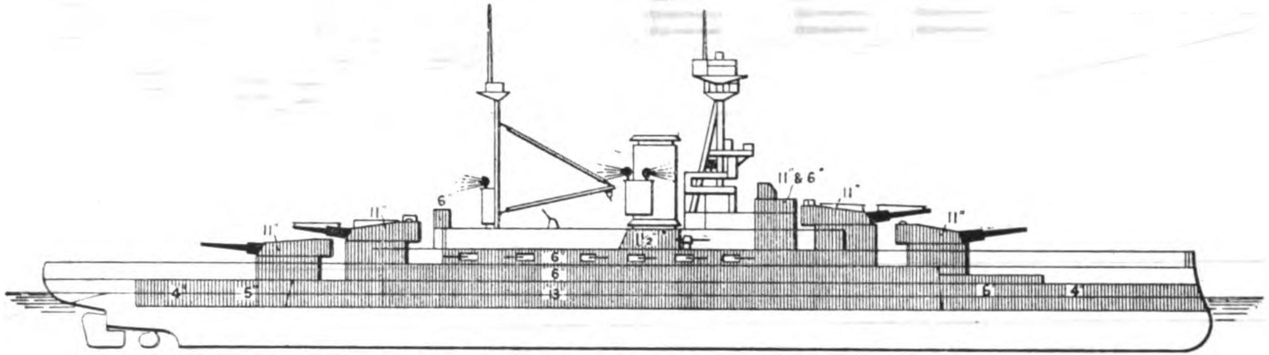
Length (extreme), 710 ft.; 33,950 tons; Speed, 23 knots; Completed, 1927.
Armament, 9—16-in.; 12—6-in.; 6—4·7-in. A.A.; many light A.A. guns; 2—24-in. submerged torpedo tubes.

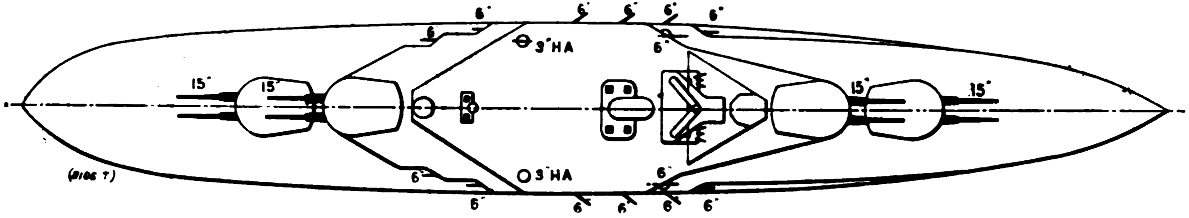
NOTE.—A 14-in. waterline armour belt extends from approximately the foremost 16-in. turret to approximately the aftermost 6-in. turret. The turret armour varies from 16-in. to 9-in.
Correction to plan.—Mast structure increased.

GREAT BRITAIN.

BATTLESHIPS.

Royal Sovereign. **Revenge.** **Resolution.** **Ramillies.**





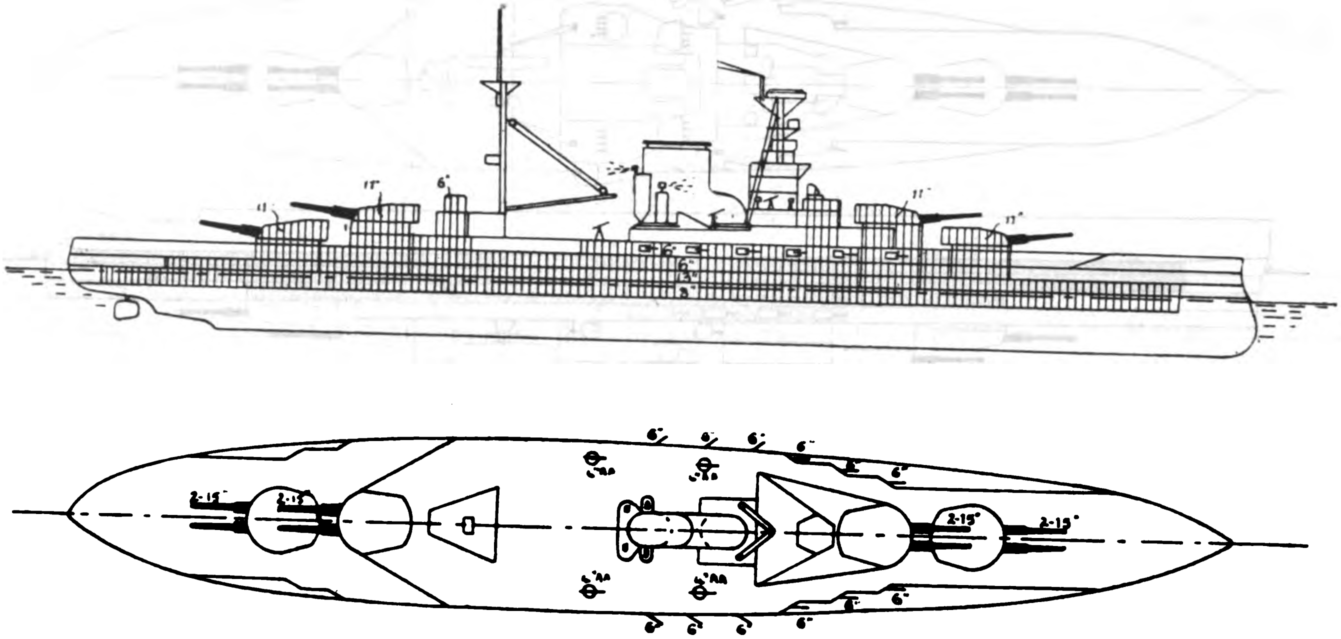
Length (extreme), 620 ft. 6 ins.* ; Length B.P., 580 ft. ; 29,150 tons ; Speed, 23 knots (without bulges) ; Completed, 1916–17.
Armament, 8—15-in. ; 12—6-in. ; 8—4-in. A.A. ; 4—3-pr. ; 5 M. ; 11 L. ; 2—21-in. submerged torpedo tubes in Revenge.
Corrections to plan.—Searchlights on mainmast and the superstructure 6-in. guns now removed. The 4-in. A.A. guns are fitted on the superstructure instead of the 3-in. H.A. shown. Fore topmast removed. Main topgallant mast fitted.

*** Revenge, 625 ft. 9 in.**

GREAT BRITAIN.

BATTLESHIP.

Malaya.



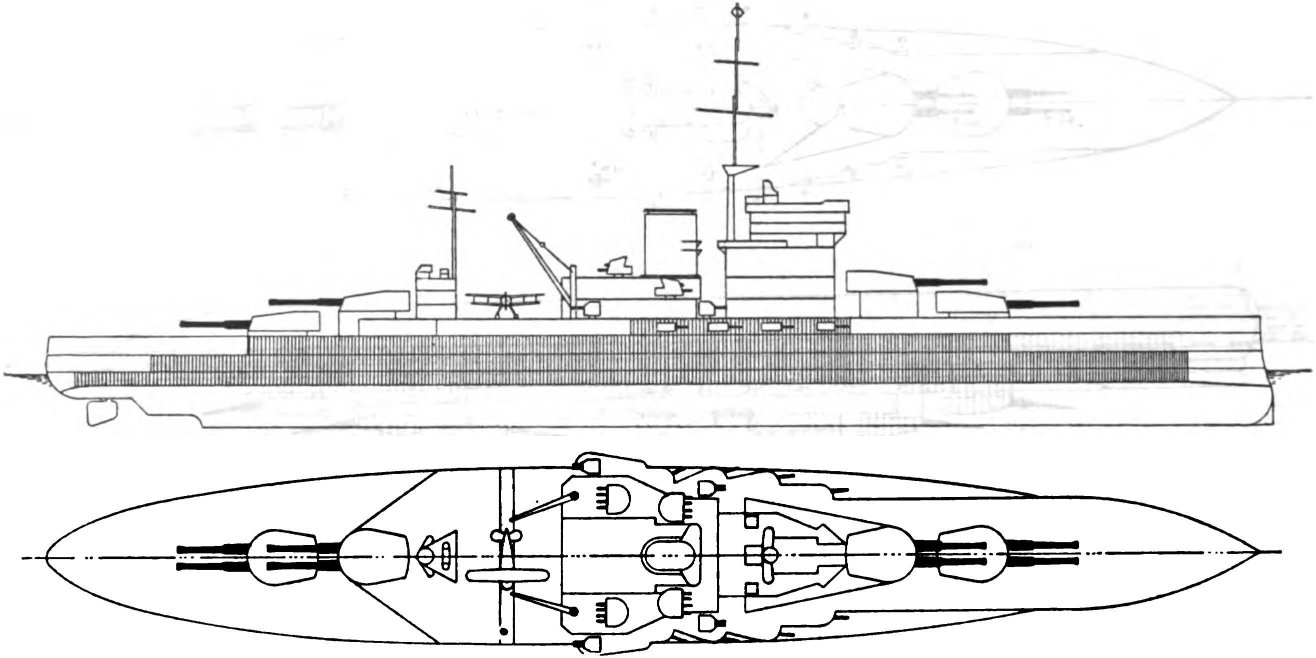
Length B.P., 600 ft.; (extreme 640 ft. 3 ins.); 31,100 tons; Speed, 25 knots (without bulges); Completed, 1915-1916.
Armament, 8—15-in.; 12—6-in.; 8—4-in. A.A.; 4—3-pr.; 5 M.; 11 L.; 1 catapult; 1 aircraft.

NOTE.—Armament has been removed.

GREAT BRITAIN.

BATTLESHIPS.

Warspite. Queen Elizabeth. Valiant.

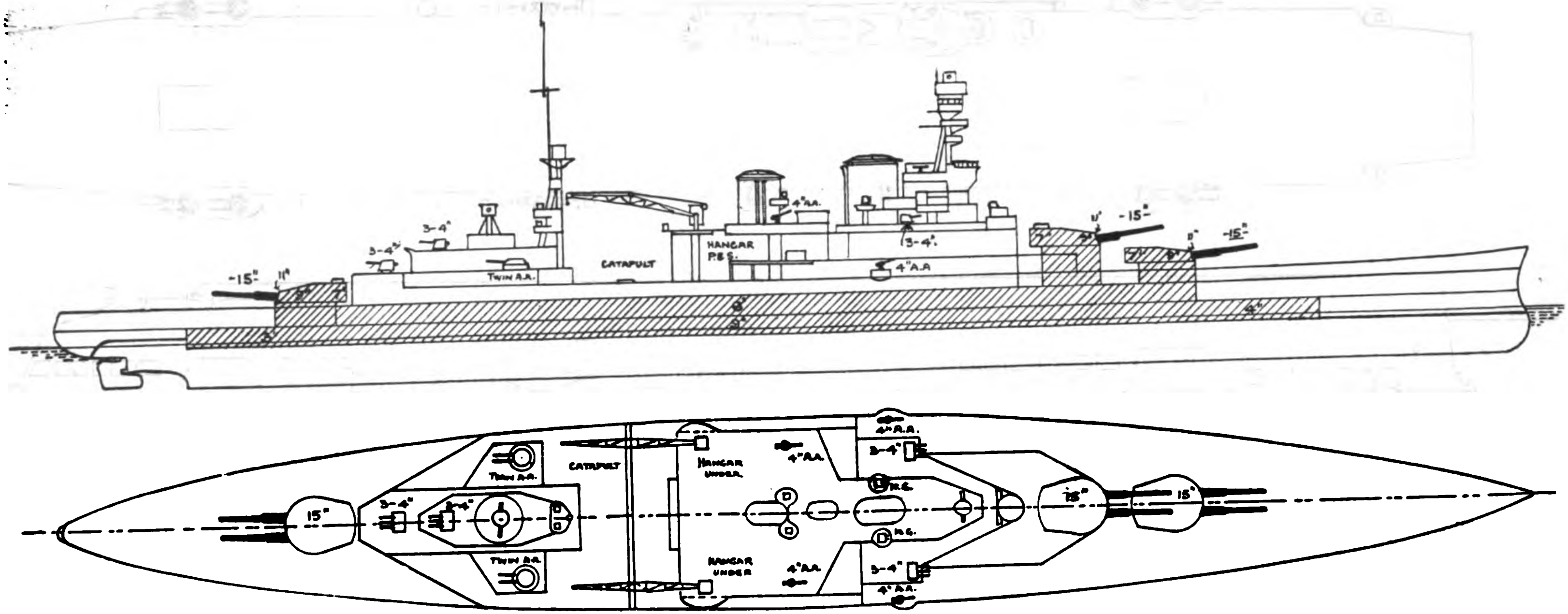


Length B.P., 600 ft.; (extreme 639 ft. 8 ins.—646 ft.); 31,100 tons; Speed, 25 knots (without bulges); Completed, 1915–1916.
Armament, 8—15-in.; 20—4·5-in. (ex Warspite which has 8—6-in.).
Note.—Warspite's armament has been removed.

GREAT BRITAIN

BATTLE-CRUISER.

Renown.

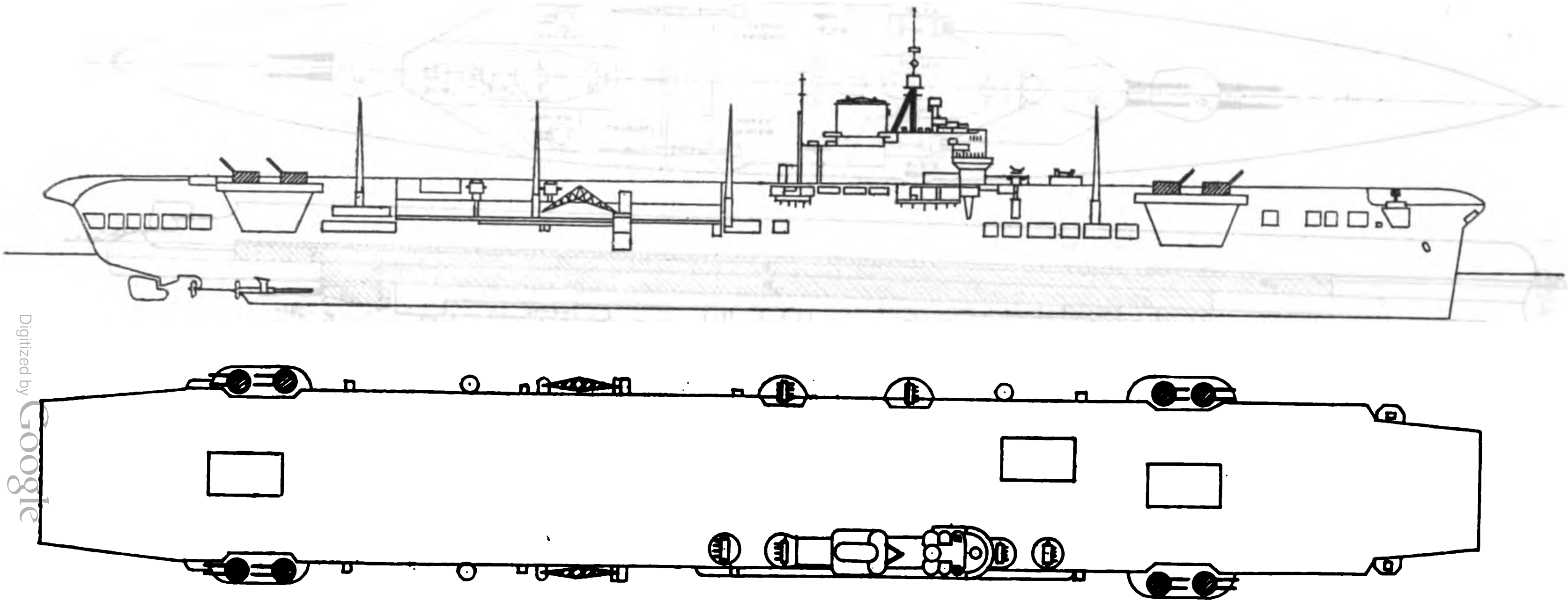


Length (extreme), 794 ft. 8 ins.; 33,000 tons; Speed, 31½ knots (without bulges); Completed, 1916. Reconstructed 1939.
Armament, 6—15-in.; 20—4·5-in.; 5 M.; 11 L.; 1 catapult; 4 aircraft.
Correction to plan.—Forward superstructure modified. Topmast and topgallant mast fitted to foremast.
The after funnel is similar to the foremost funnel.
Tripod mainmast replaced by polemast. Main topgallant mast removed.

GREAT BRITAIN.

AIRCRAFT CARRIERS.

Illustrious. Victorious. Formidable. Indomitable.

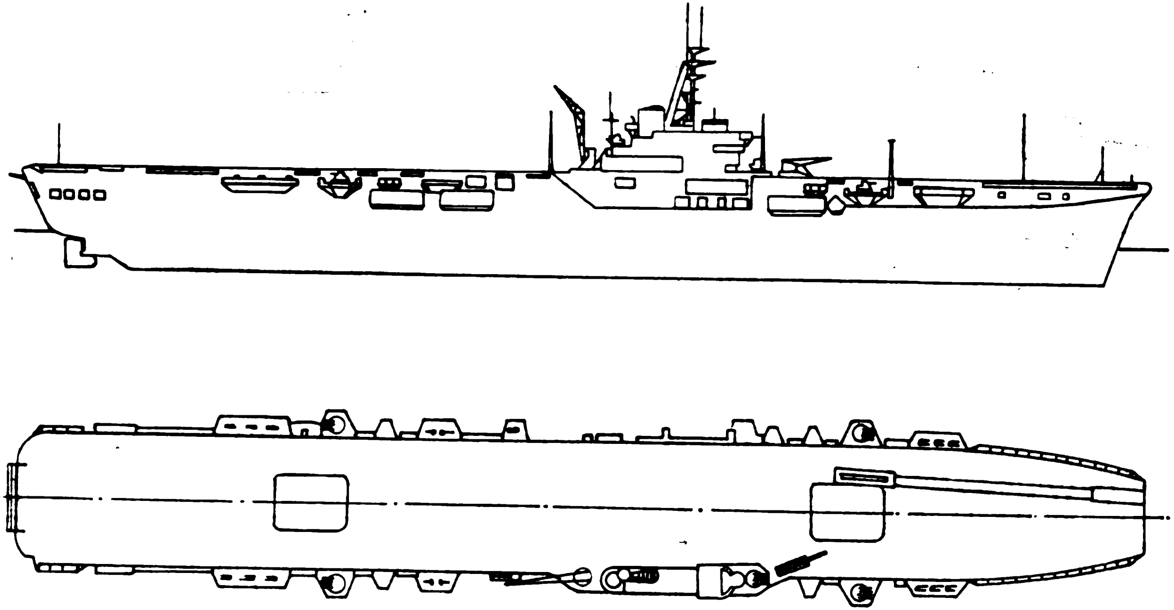


Length, 740 ft.; 23,000 tons; speed, 30½ knots.
Illustrious completed, 1940; Victorious, 1941; Formidable, 1940; Indomitable, 1941.
Armament 16—4·5-in. guns; 20 smaller.

GREAT BRITAIN.

LIGHT FLEET AIRCRAFT CARRIERS.

"Colossus" class. Colossus, Vengeance, Venerable, etc.

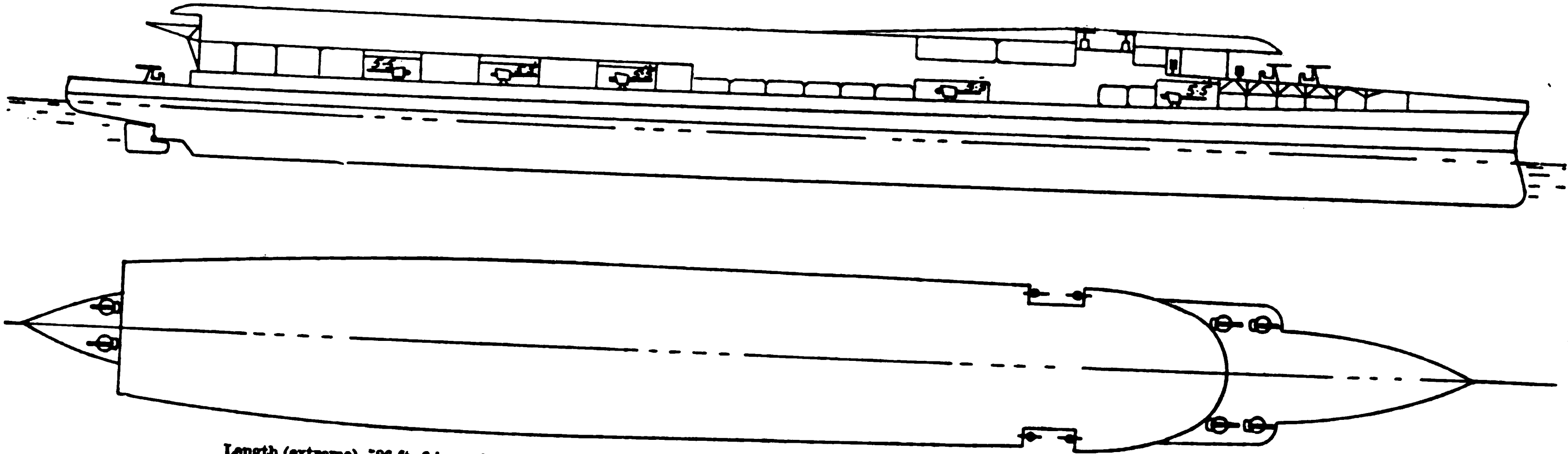


Length, 740 feet; 14,000 tons; Speed, 25 knots.
Armament, 6 m.p.p.'s; a number of light A.A. guns.

GREAT BRITAIN.

AIRCRAFT CARRIER.

Furious.



Length (extreme), 786 ft. 6 ins. ; 22,450 tons; Speed, 30 knots; Completed as a cruiser, 1917; Conversion to aircraft carrier completed, 1925.
Armament, 12—4-in. ; 4—2-pr. ; 46 smaller ; 33 aircraft.
Three wireless masts added each side of flight deck. Quarter deck has been raised one deck.
Top deck forward has been levelled off and closed in.
Superstructure, polemast and spotting-top fitted amidships on the starboard side.
Single mounts shown replaced by twins.

GREAT BRITAIN.

CRUISERS.

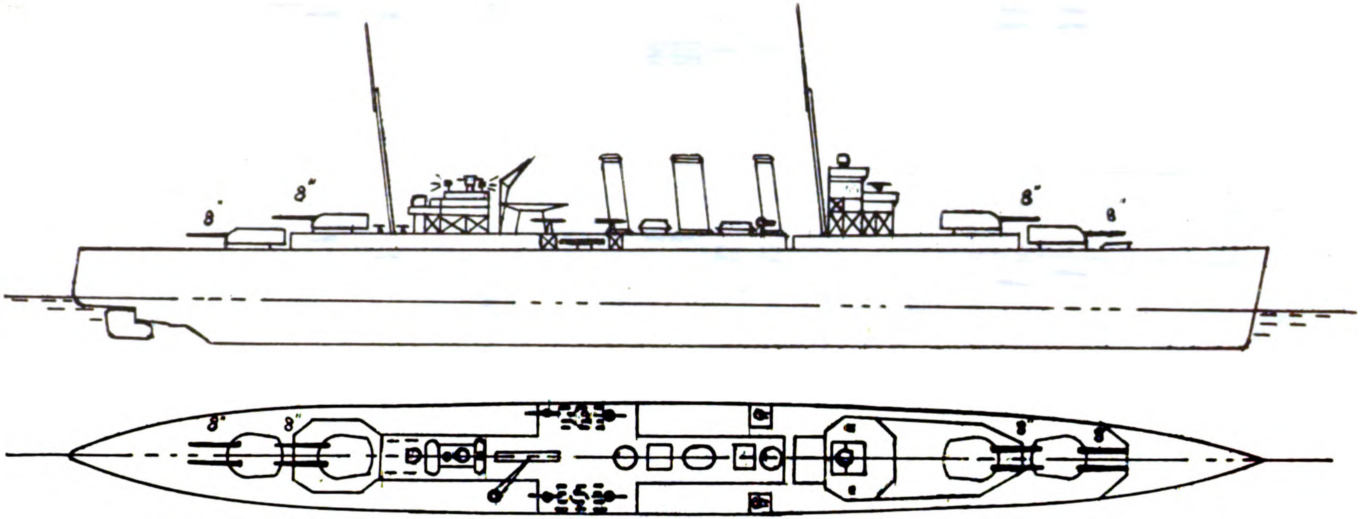
"London" Class.

London.†   Sussex.   Devonshire.

Royal Australian Navy. Cruiser. Shropshire.

"Norfolk" Class.

Norfolk.



Displacements, 9,850 tons; Length (extreme), 630 ft.; Sussex and Norfolk, 633 ft.; Speed, 32¼ knots. Armament, 8—8-in. 8—4-in. A.A.; many light A.A. guns; 8—21-in. torpedo tubes.

Fore topgallant mast added. Fore and main masts are tripod. Aircraft arrangements removed.

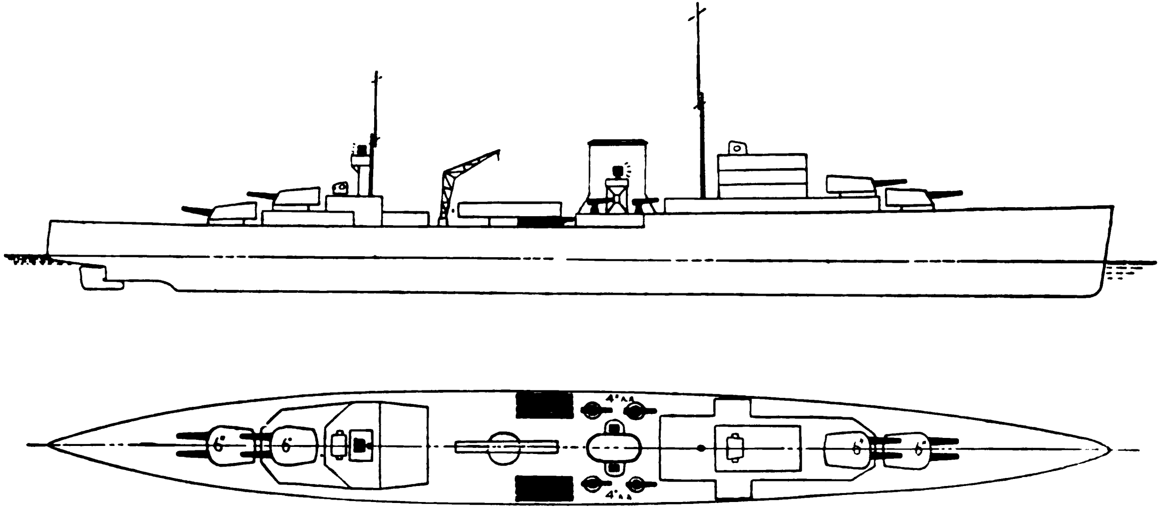
† London, as reconstructed, is of totally different appearance from the others.

GREAT BRITAIN.

CRUISERS.

"Leander Class."

Leander. **Achilles.** **Orion.** **Ajax.**



Displacement, 6,895–7,270 tons; Length (extreme), 554 ft. 6 ins.; Speed, 32½ knots. Armament, 8—6-in., 8—4-in. A.A., 4—3-pr., 8 torpedo tubes.
Leander and Achilles are on loan to Royal New Zealand Navy.
Masts are now of tripod type. Aircraft removed.

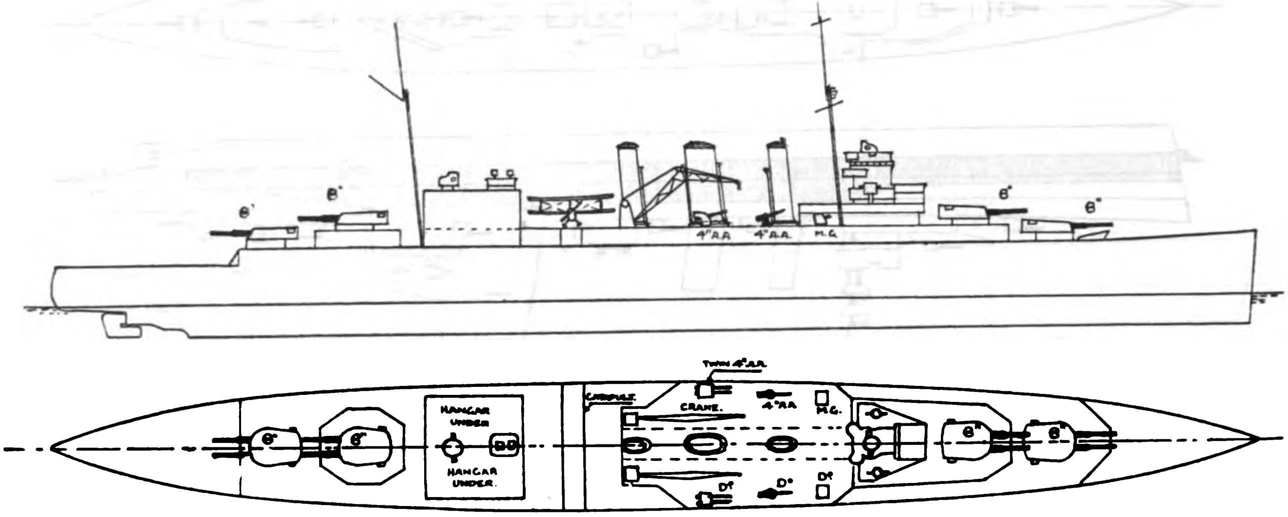
GREAT BRITAIN.

CRUISERS.

"Kent" Class.

Berwick. Kent. Cumberland. Suffolk. Australia.*

(As reconstructed 1936–1938.)



'Length (extreme), 630 ft.; 10,000 tons; Speed 31½ knots; Completed 1928. Armament, 8—8-in.; 8—4-in. A.A.

NOTES.—Berwick, Kent and Australia are flush-decked. Aircraft arrangements removed.

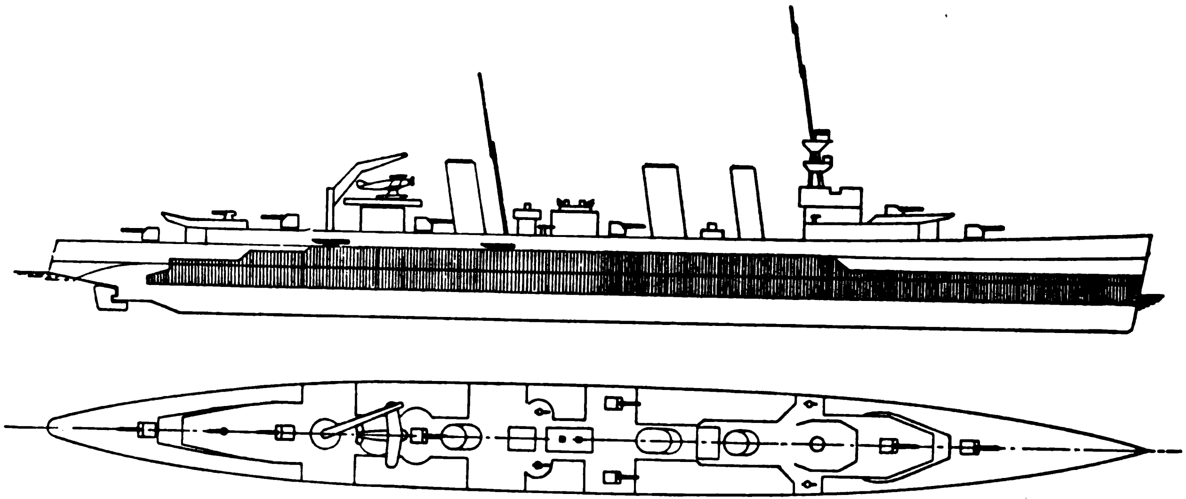
* Royal Australian Navy.

GREAT BRITAIN.

CRUISERS.

"*E*" *Class.*

Emerald. **Enterprise.***



Length (extreme), 570 ft.; Length B.P., 535 ft.; Emerald, 7,550 tons; Enterprise, 7,580 tons; Speed, 30 knots.
Armament, 7—6-in.; 3—4-in. A.A.; 2—2-pr. Pom Poms; 7 smaller; 8—21-in. torpedo tubes.

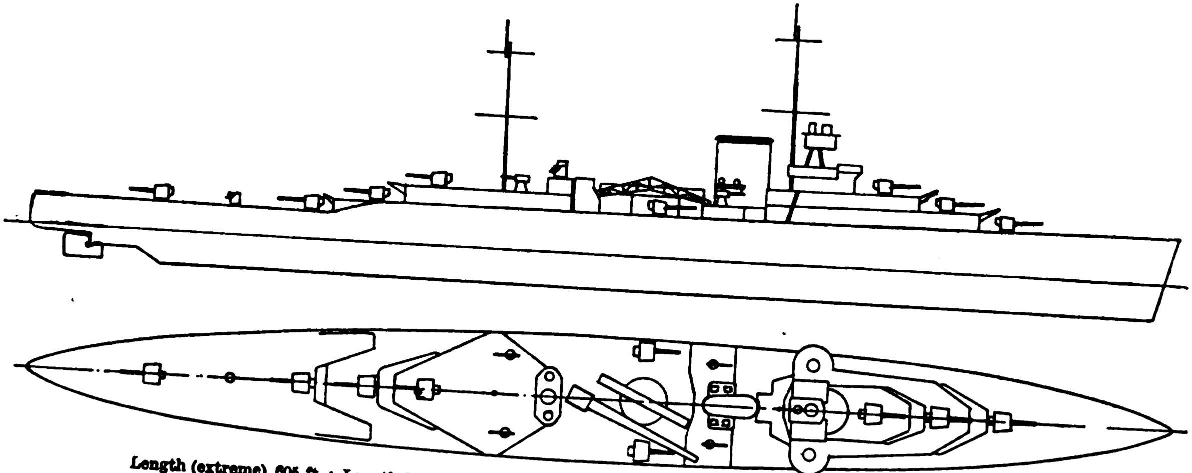
* In Enterprise the two forward 6-in. guns are mounted in a twin mounting on forecastle deck. Aircraft removed.

GREAT BRITAIN.

CRUISERS.

"*Hawkins*" *Class.*

Hawkins. **Frobisher.**



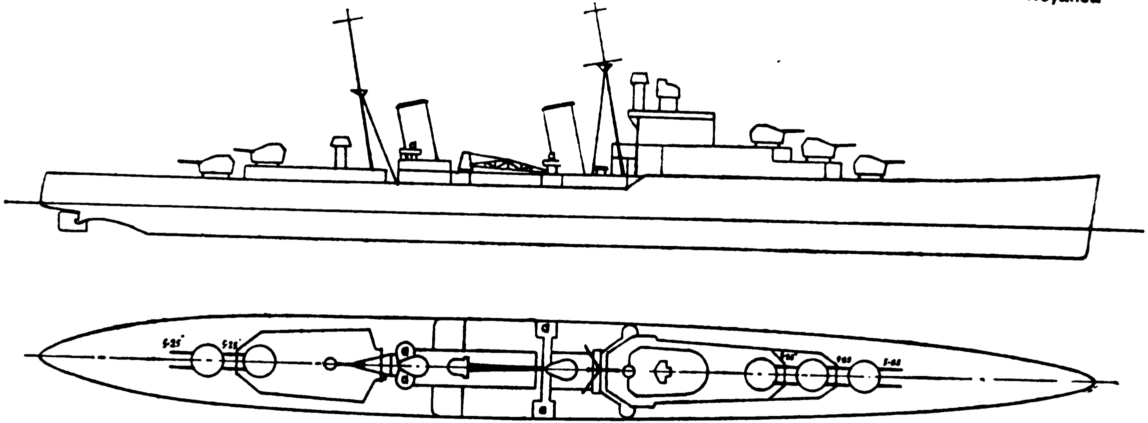
Length (extreme), 605 ft. ; Length B.P., 565 ft. ; 9,800—9,860 tons ; Speed: Hawkins 29½ knots ; Frobisher 30½ knots.
Armament: rearmed with 5—7·5-in. ; 5—4-in. A.A. ; 2—2-pr. ; 2 M. ; 8 L. ; 4 torpedo tubes.
Aircraft removed.

GREAT BRITAIN.

CRUISERS.

"Dido" Class.

Cleopatra. Dido. Euryalus. Scylla. Sirius. Phœbe. Bellona. Black Prince. Diadem. Royalist.



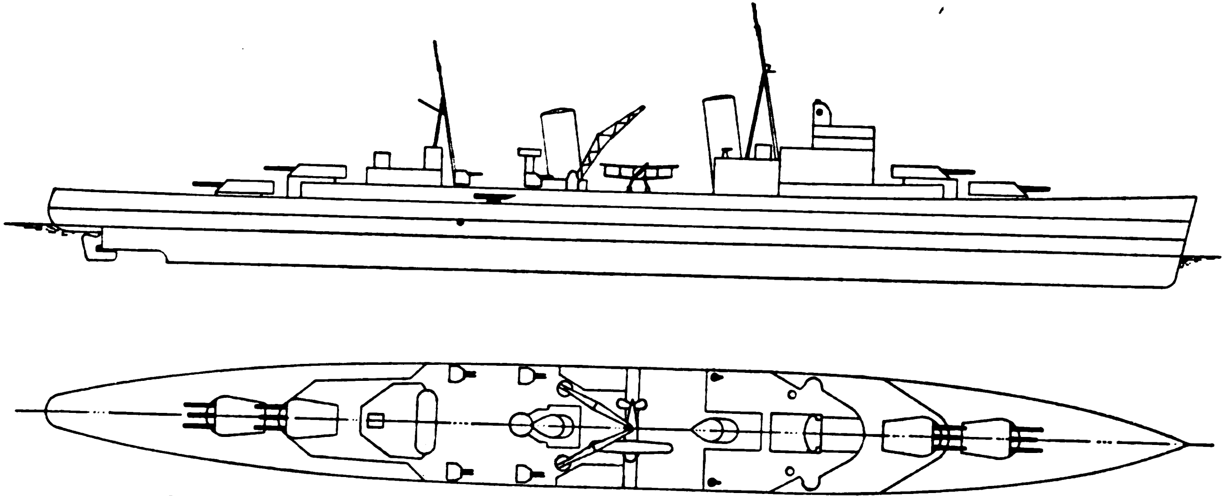
Length (extreme), 506 ft.; 5,450 tons ; Speed, 33 knots ; Completed, 1941–43.
Armament, 8 or 10—5·25-in.; 6—21-in. torpedo tubes.
Scylla has 8 4·5-in. Aircraft removed.

GREAT BRITAIN.

CRUISERS.

"*Southampton*" *Class.*

Newcastle. **Sheffield.** **Birmingham.** **Glasgow.** **Liverpool.**



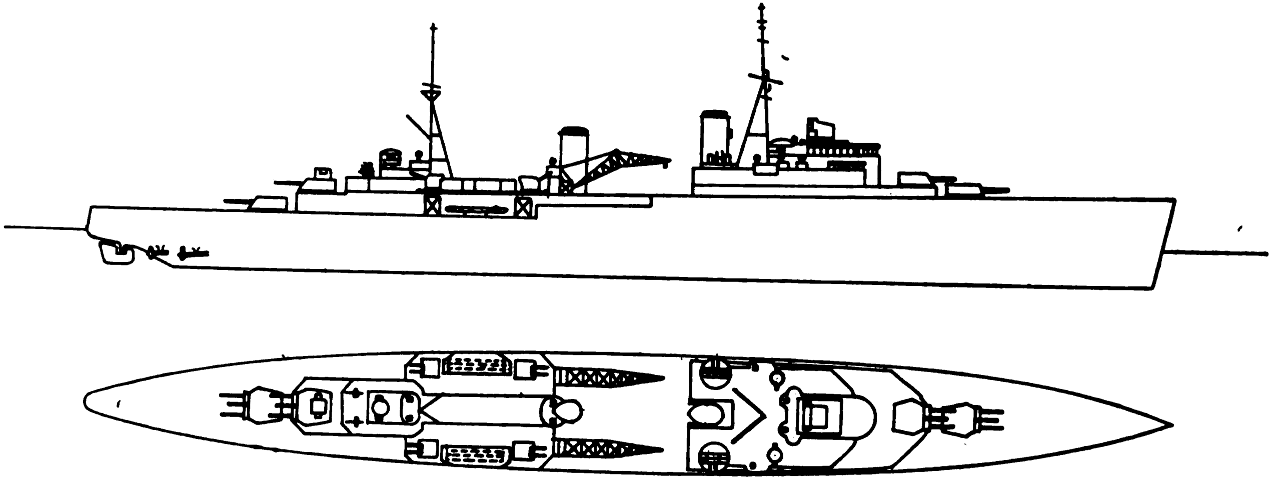
Length (extreme), 591 ft. 6 ins.; 9,100 tons (Liverpool 9,400 tons); Speed, 32 knots; Completed, 1937-38.
Armament, 12—6-in.; 8—4 in. A.A.; 6—21-in. torpedo tubes.
Corrections—1 6-in. turret and aircraft removed.

GREAT BRITAIN.

CRUISERS.

"*Fiji*" *Class.*

Bermuda. Jamaica. Mauritius. Kenya. Nigeria.



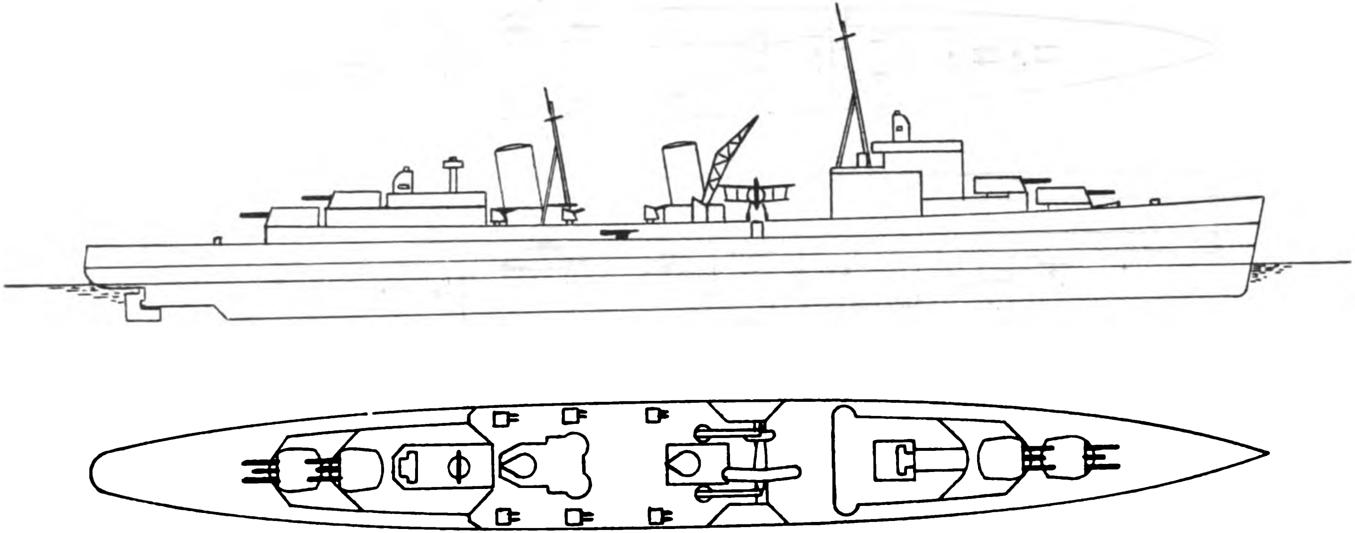
Length (extreme), 555 ft. 6 in.; 8,000 tons; Speed, 32 knots; Completed, 1940–42.
Armament: 12—6-in.; 8—4-in. A.A.; 16 smaller.
Bermuda and Jamaica have 9 6-in. Aircraft removed.

GREAT BRITAIN.

CRUISER.

Improved "Southampton" Class.

Belfast.



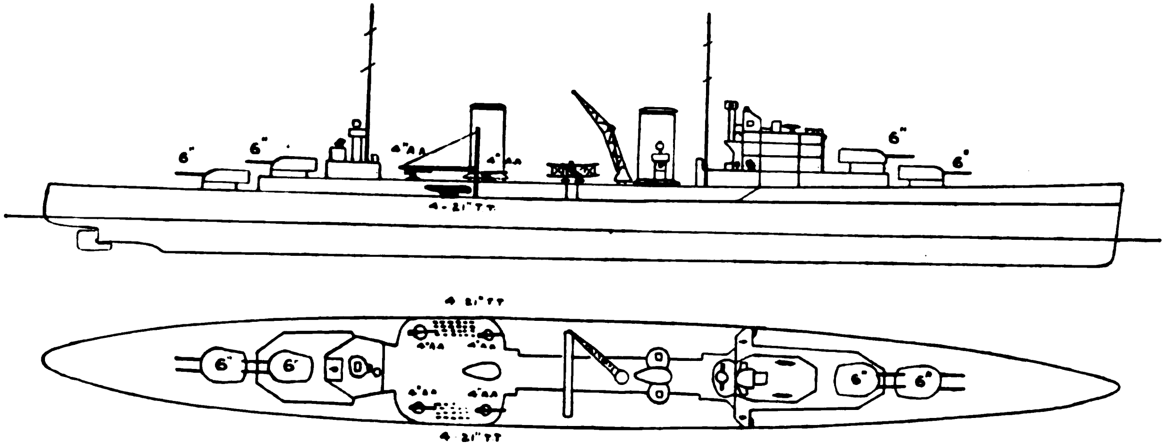
Length (extreme), 613 ft. 6 ins.; 10,000 tons; Speed, 32½ knots; Completed, 1939.
Armament 12—6-in.; 8—4-in. A.A.; 20 smaller guns; 6 torpedo tubes.

COMMONWEALTH OF AUSTRALIA.

CRUISER.

Modified "Leander" Class.

Hobart (*ex*-**Apollo**)



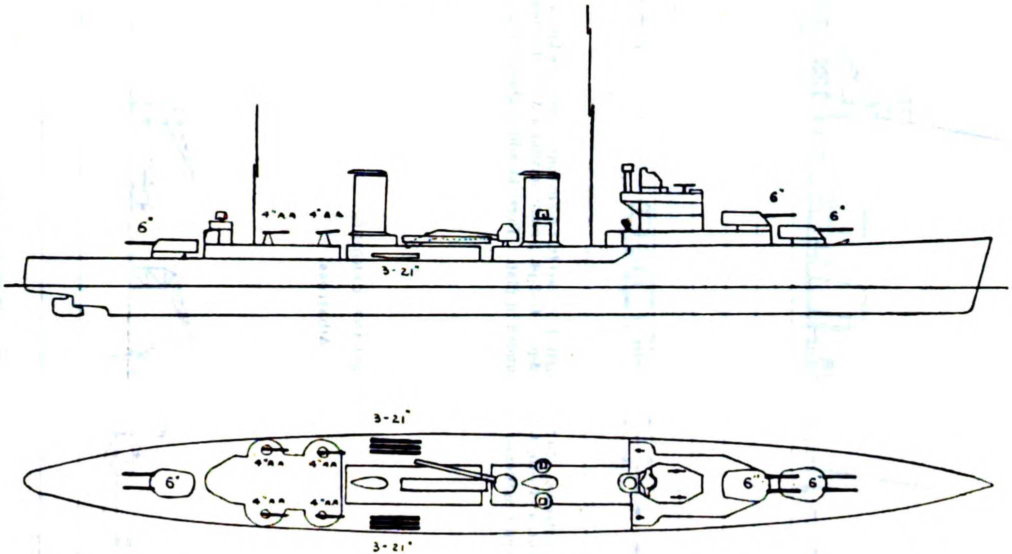
Displacement, 7,000 tons; Length (extreme), 562 ft.; Speed, 32½ knots; Completed, 1936.
Armament, 7—6-in.; 8—4-in. A.A.; 18 smaller guns; 8—12-in. torpedo tubes.
Aircraft removed.

GREAT BRITAIN.

CRUISERS.

"*Arethusa*" *Class.*

Arethusa. **Aurora.**



Displacement, 5,220–5,270 tons ; Length (extreme), 506 ft. ; Speed, 32¼ knots; Completed 1935–37.
Armament, 6—6-in. ; 8—4-in. A.A. ; 9 smaller ; 2 triple 21-in. torpedo tubes.

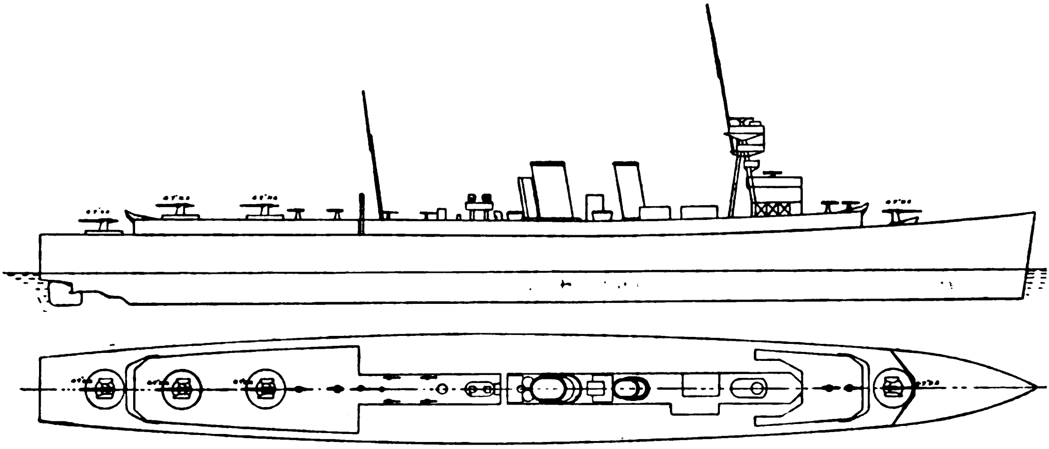
4-in. guns are in twin mountings

Masts are of tripod type. Aircraft removed.

GREAT BRITAIN.

CRUISER MINELAYER:

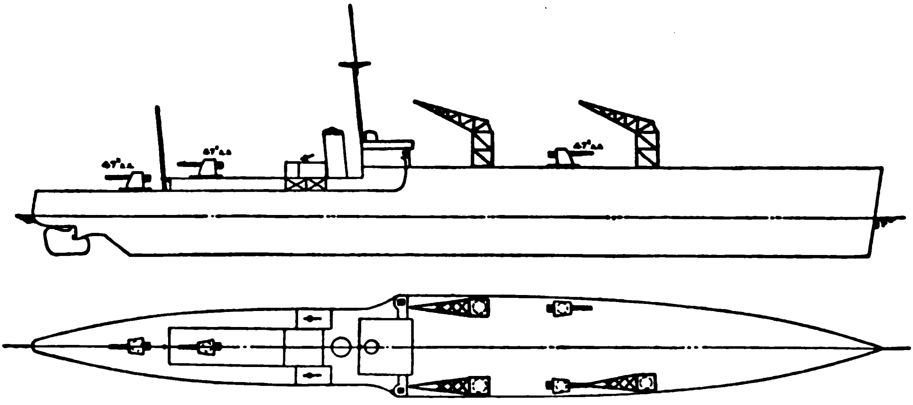
Adventure.



Length (extreme), 539 ft.; Length B.P., 500 ft.; 6,740 tons; Speed, 28 knots.
Armament, 4—4·7-in. A.A.; 4—3-pr.; 4—2-pr.; many smaller A.A.; 310 mines.
Stern has been lengthened and rounded in plan. Derricks added abreast masts.

SEAPLANE CARRIER.

Albatross.



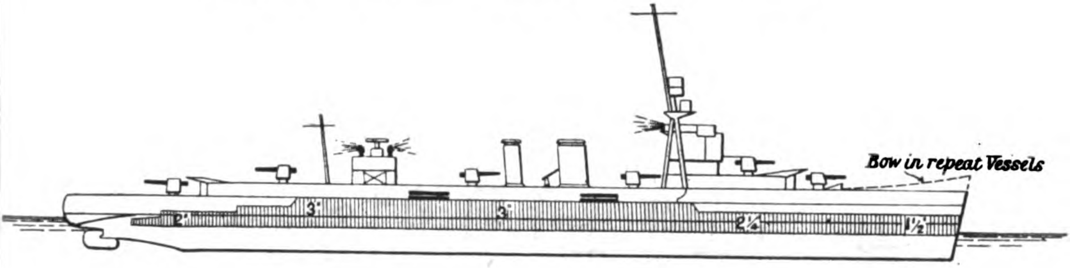
Length, 443¾ ft.; 4,800 tons; Speed, 21 knots; Completed, 1929.
Catapult fitted forward. 9 seaplanes.
Armed with light A.A. guns.

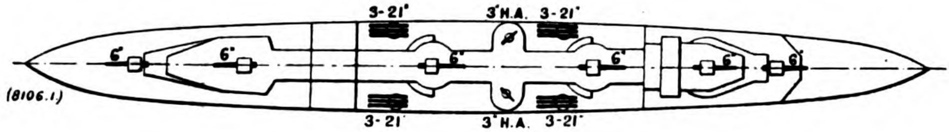
GREAT BRITAIN.

CRUISERS.

"D" Class.

***Despatch.** ***Diomede.** **Danae.†** **Dauntless.** ***Delhi.**





Length, 472¾ ft.; 4,850 tons; Speed, 29 knots;
Armament, 6—6-in.; 3—4-in. A.A.; 2—2-pr.; 2 M.; 8 L.

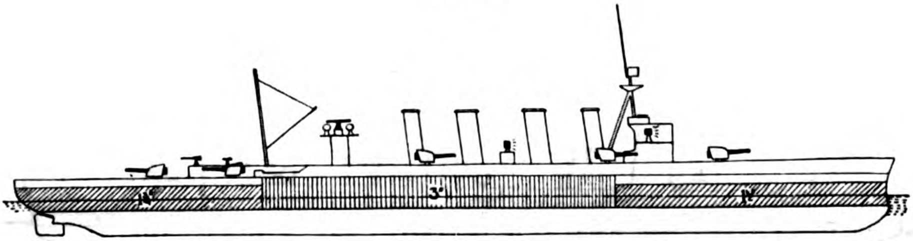
Main topmast fitted. Foremost gun in Diomede housed in gunhouse. Torpedo tubes removed.

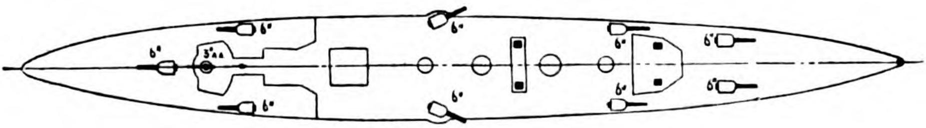
*** Repeat vessels.** **†On loan to Polish Navy—renamed Conrad.**

COMMONWEALTH OF AUSTRALIA.

CRUISER.

Adelaide.





Length, 462¾ ft.; 5,100 tons; Speed, 25½ knots; Completed, 1922.
Armament, 7—6-in.; 2—4-in.; 8 L.

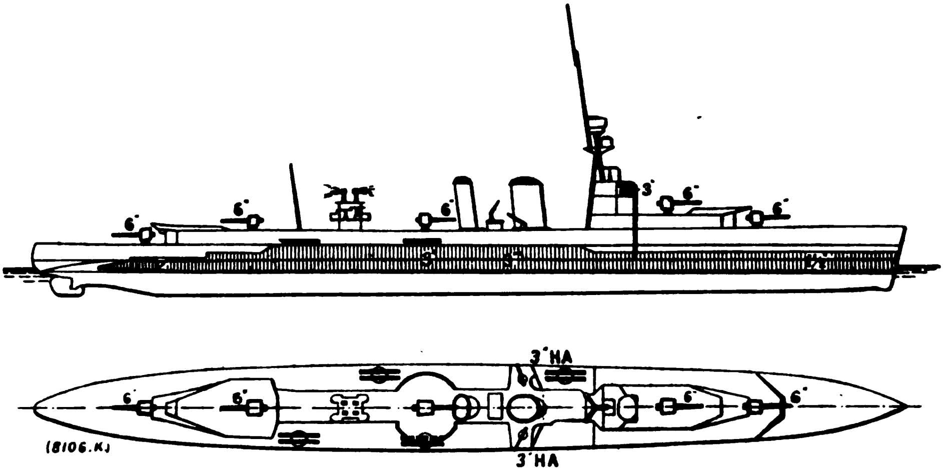
Forward funnel removed and superstructure modified. One 6-in. gun removed.

GREAT BRITAIN.

CRUISERS.

"Ceres" Class.

Ceres. **Cardiff.**



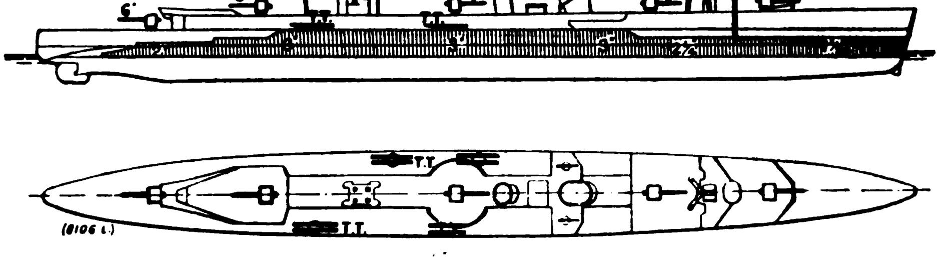
Length (extreme), 450 ft.–451 ft. 9 ins.; Length B.P., 425 ft.; 4,200–4,290 tons; Speed, 29 knots; Completed, 1917–22.

Armament, 5—6-in.; 2—3-in. A.A.; 2—2-pr. Pom Poms; 4 above-water 21-in. D.R. torpedo tubes.

CRUISERS.

"Caledon" Class.

Caledon. **Caradoc.**



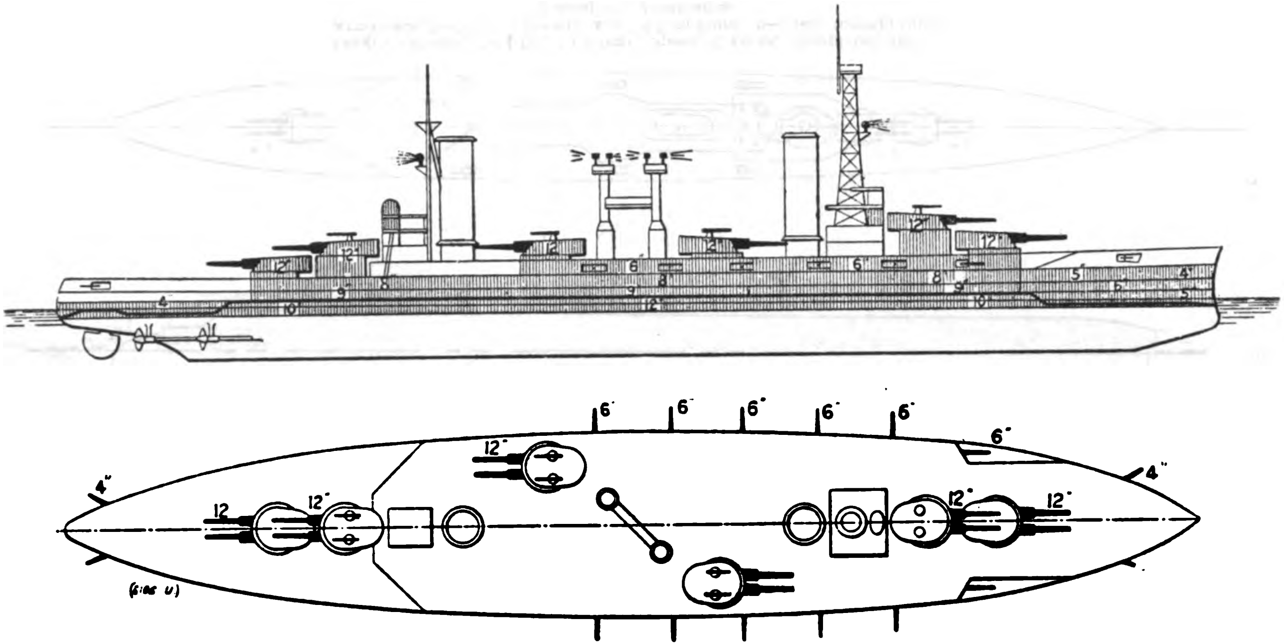
Length (extreme), 450 ft.; Length B.P., 425 ft.; 4.180 tons; Speed, 29 knots; Completed, 1917.
Armament, 5—6-in.; 2—2-pr. Pom Poms; 2 M.; 8 L.; and 4 above-water 21-in. D.R. torpedo tubes.
Mainmast lengthened.

Caledon has 6—4-in. guns.

ARGENTINA.

BATTLESHIPS.

Moreno. **Rivadavia.**

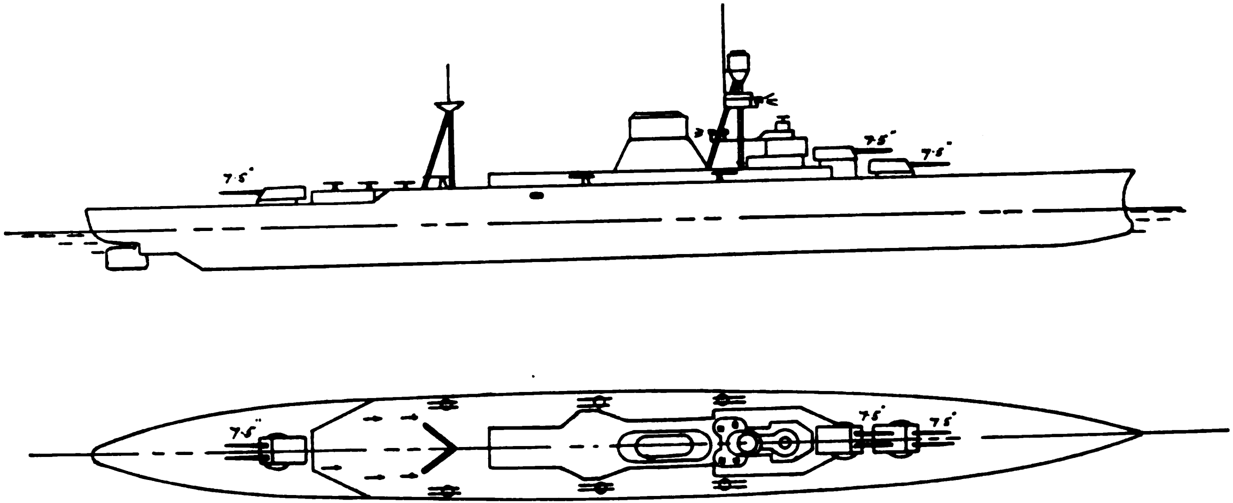


Length (extreme), 585 ft.; Length on W.L., 575 ft.; 27,940 tons; Speed, 22½ knots; Completed, 1914–15.
Armament, 12—12-in.; 12—6-in.; 4—3-in. A.A.; 4 M.; 4 L.; 2 submerged 21-in. torpedo tubes.
3-pdr. guns on B and X turrets replaced by rangefinders.
Derricks fitted to midship towers.

ARGENTINA.

CRUISERS.

Almirante Brown. **Vinticinco de Mayo.**



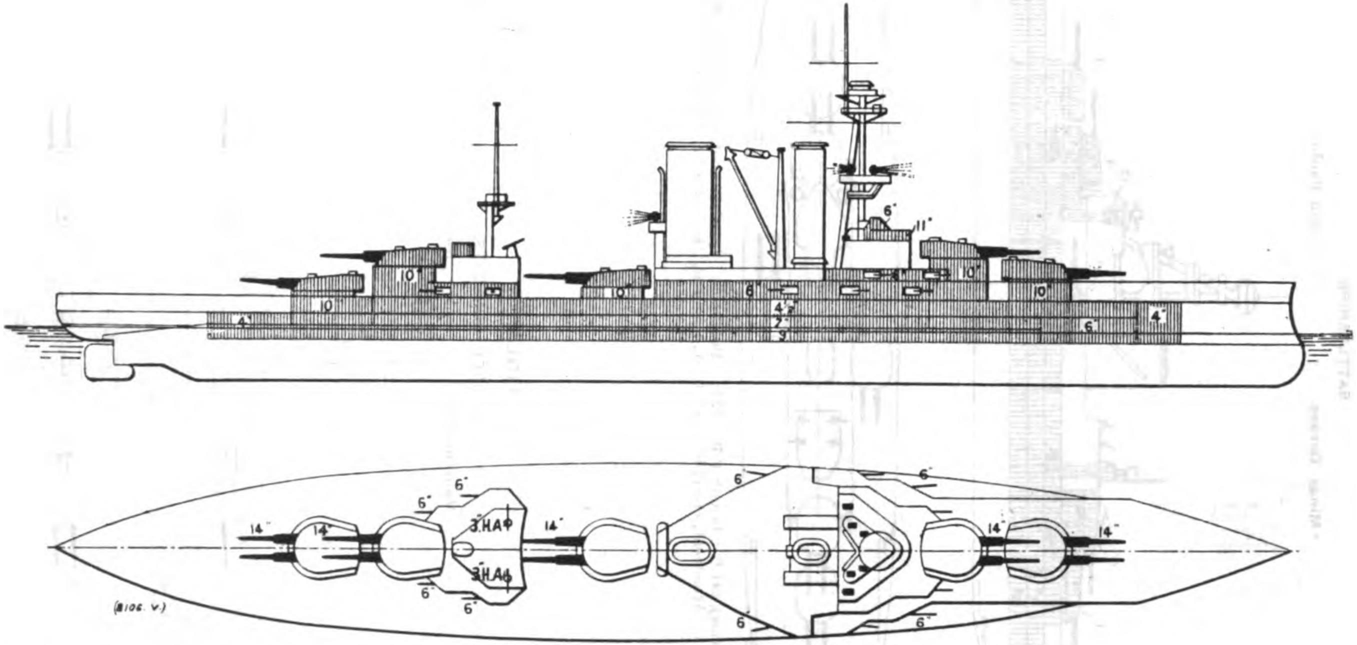
Length (extreme), $545\frac{3}{4}$ ft.; 6,495 tons; Speed, 32 knots. Completed, 1931.
Armament, 6—7·5-in.; 12—4-in. A.A.; 6 Pom Poms; 6—21-in. torpedo tubes
1 catapult; 2 seaplanes.

Corrections to plan.—Derrick fitted on fore side of mainmast. Superstructure built aft side of mainmast.

CHILE.

BATTLESHIP.

Almirante Latorre (*formerly* H.M.S. Canada).



Length (extreme), 661 ft. ; Length B.P., 625 ft. ; Standard Displacement, 28,950 tons; Speed, 23 knots ; Completed, 1915 ; Modernised at Devonport Dockyard, 1929–31.
Armament, 10—14-in. ; 14—6-in. ; 4—4-in. A.A. ; 4—1·3-in. ; 4 submerged 21-in. torpedo tubes; 1 catapult.

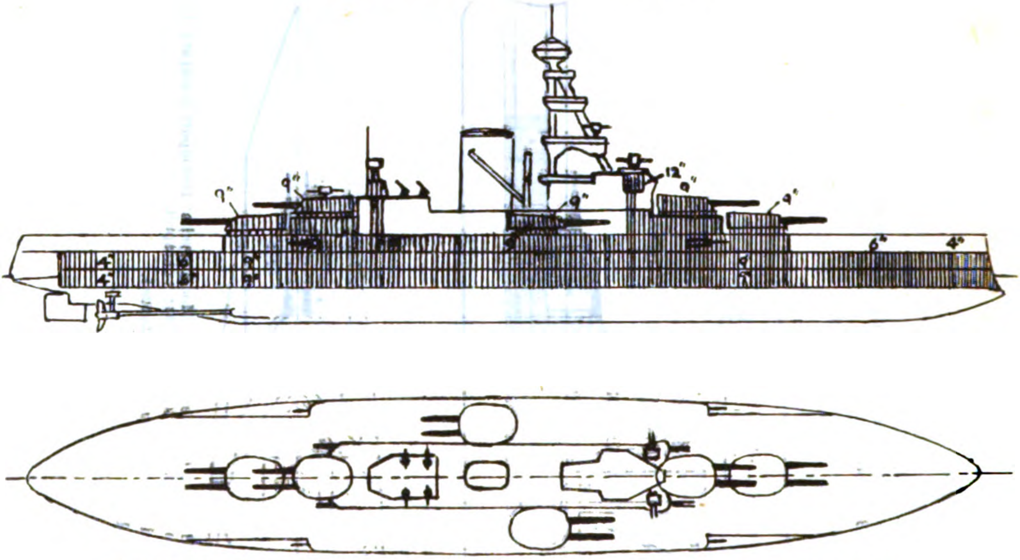
* During modernisation main topmast has been raised and bridge platforms extended.

Catapult fitted on quarter deck.

BRAZIL.

BATTLESHIPS.

Minas Geraes. **São Paulo.**

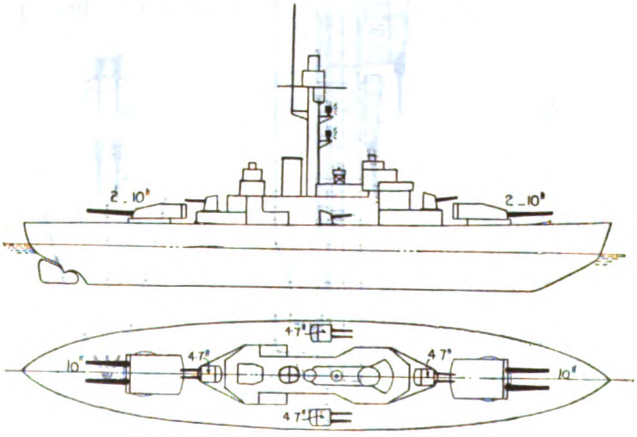


Length (extreme), 541 ft. ; Length B.P., 500 ft. ; 19,200 tons ; Speed, 21 knots ; Completed, 1909, 1910.
Armament, 14—12-in. ; 14—4·7-in. ; 2—3-pr. ; 4—3-in. A.A. ; 8 M. A.A.

FINLAND.

ARMOURED GUNBOATS.

Väinämöinen. **Ilmarinen.**

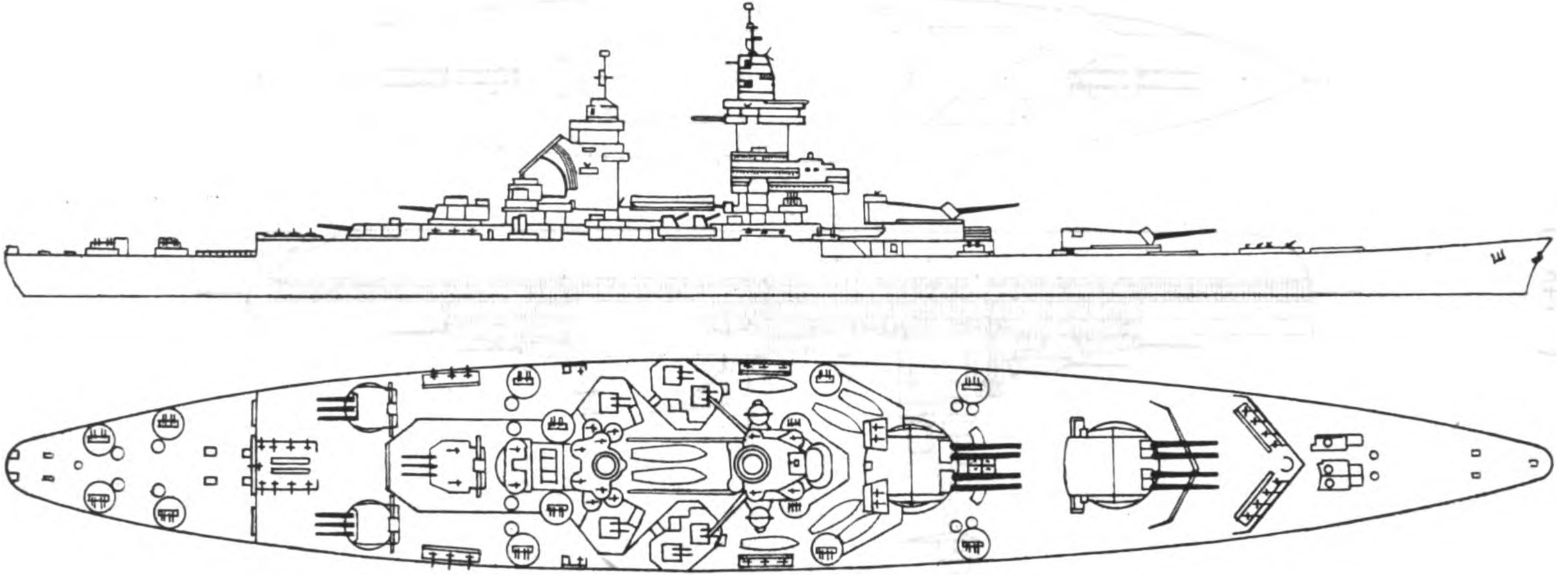


Length, 300 ft. ; 3,900 tons ; Speed, 15 knots.
Armament, 4—10-in. ; 8—4·1-in. A.A. ; 4 M.
Completed, 1932—33.

FRANCE.

BATTLESHIP.

Richelieu.

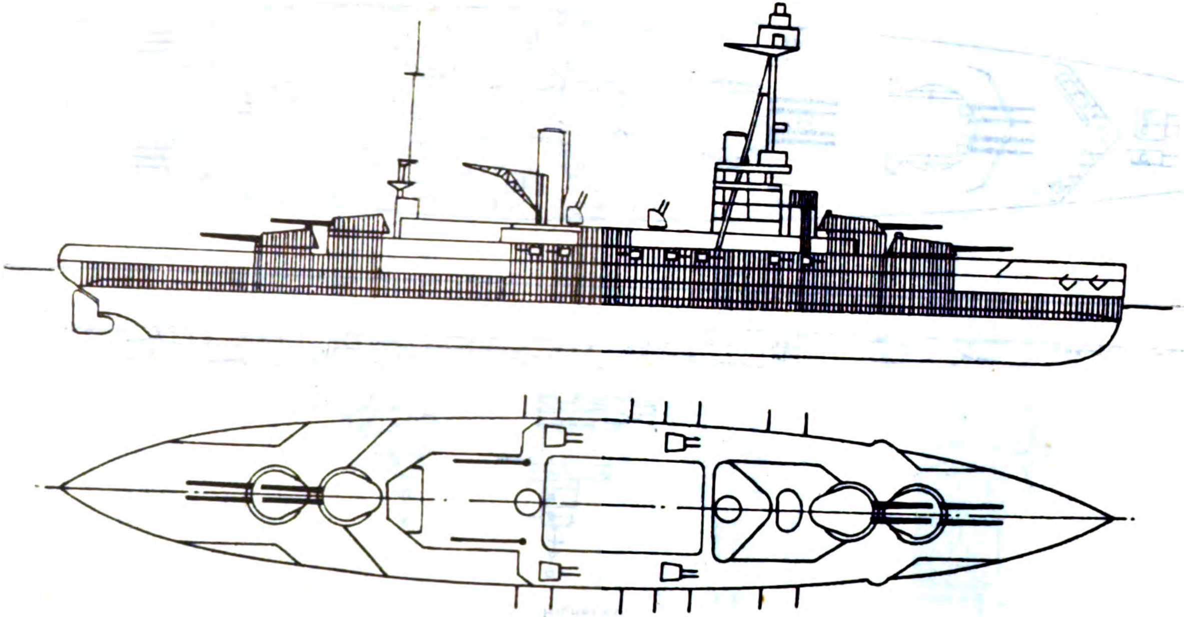


Length, 794 ft.; 35,000 tons; Speed, 31 knots, approx.
Armament, 8—15-in.; 9—6-in.; 12—3-in. A.A.; 67—40-m.m. A.A.; 39—20-mm. A.A.

FRANCE.

BATTLESHIP.

Lorraine.



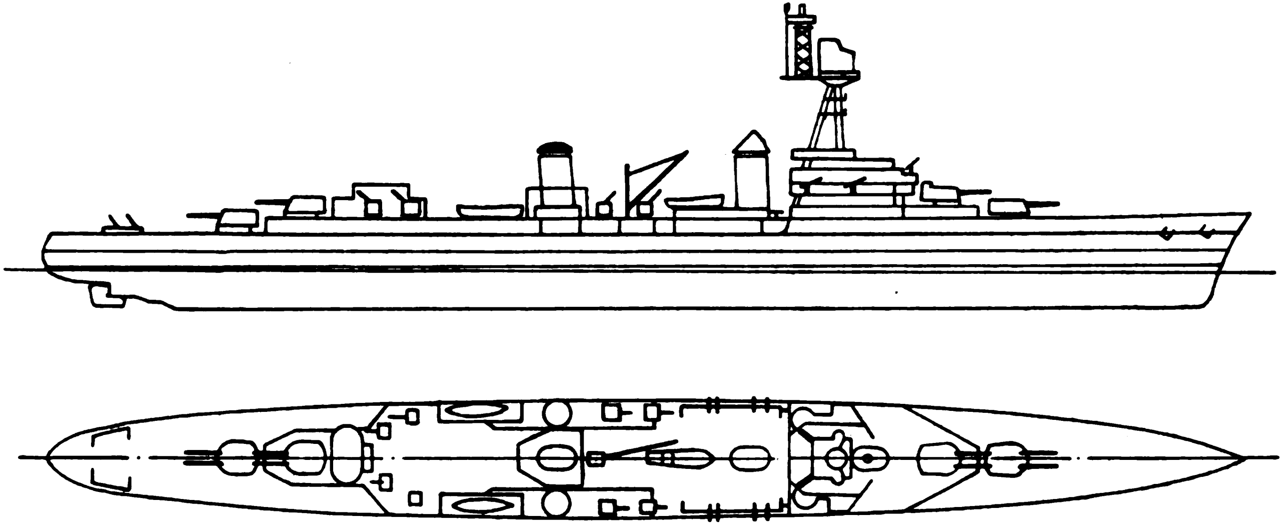
Length (extreme), 544 ft. 6 ins.; **22,189 tons; Speed, 21 knots.**

Armament, 10—13·4-in.; 14—5·4-in.; **8—3-in. A.A.** Many smaller.

FRANCE.

CRUISERS.

Duquesne. **Tourville.** (“*Duquesne*” *Class.*) **Suffren.**



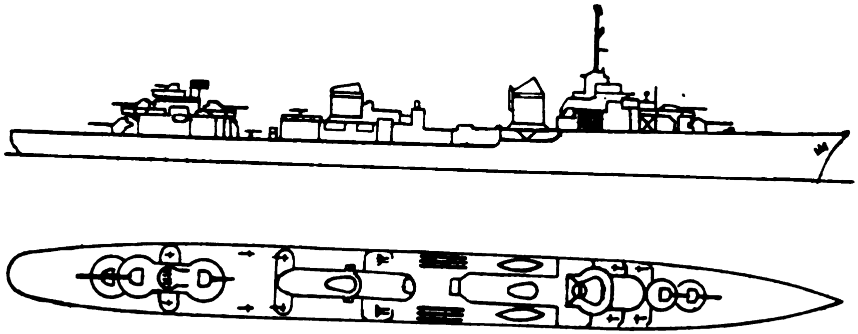
Length, 643 ft; 10,000 tons; Speed, 32 knots (Duquesne and Tourville, 33·2 knots).

Armament, 8—8-in., 8—3-in. A.A. (Dupleix, Colbert and Foch have 8—3·5-in. A.A.); 8—1 6-in. A.A.

FRANCE.

LIGHT CRUISERS.

Le Fantasque. **Le Malin.** **Le Terrible.** **Le Triomphant.**

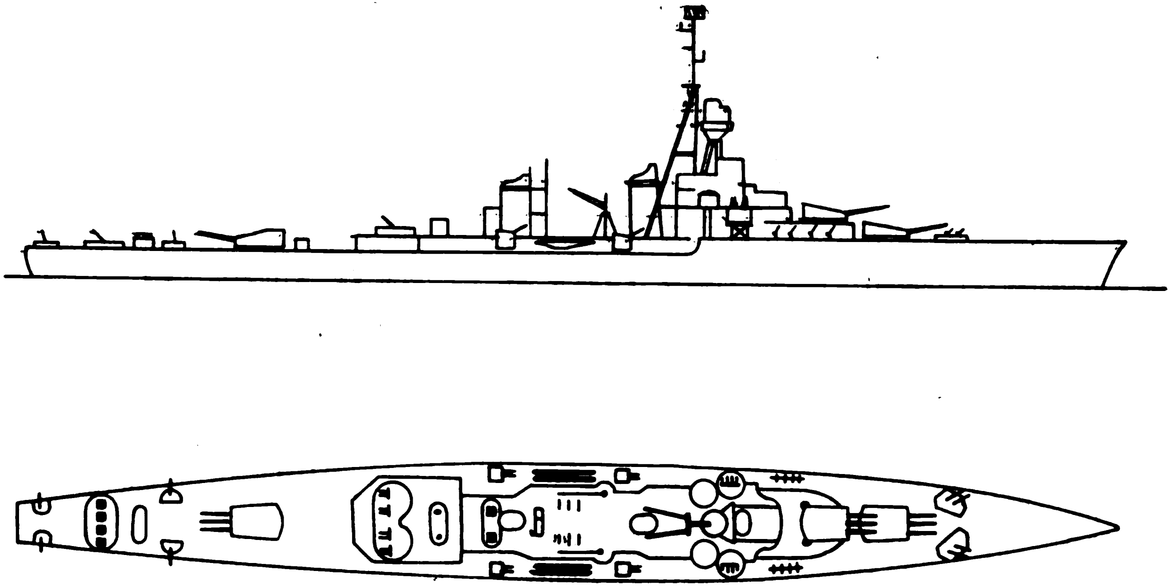


Length, 434 ft. 6 ins.; 2,569 tons; Speed, 37 knots.
Armament, 5—5·4-in.; 8—40-mm. A.A.; 10—20-mm. A.A.; 6—21-in. T T

FRANCE.

CRUISERS.

Gloire. **Montcalm.** **Georges Leygues**

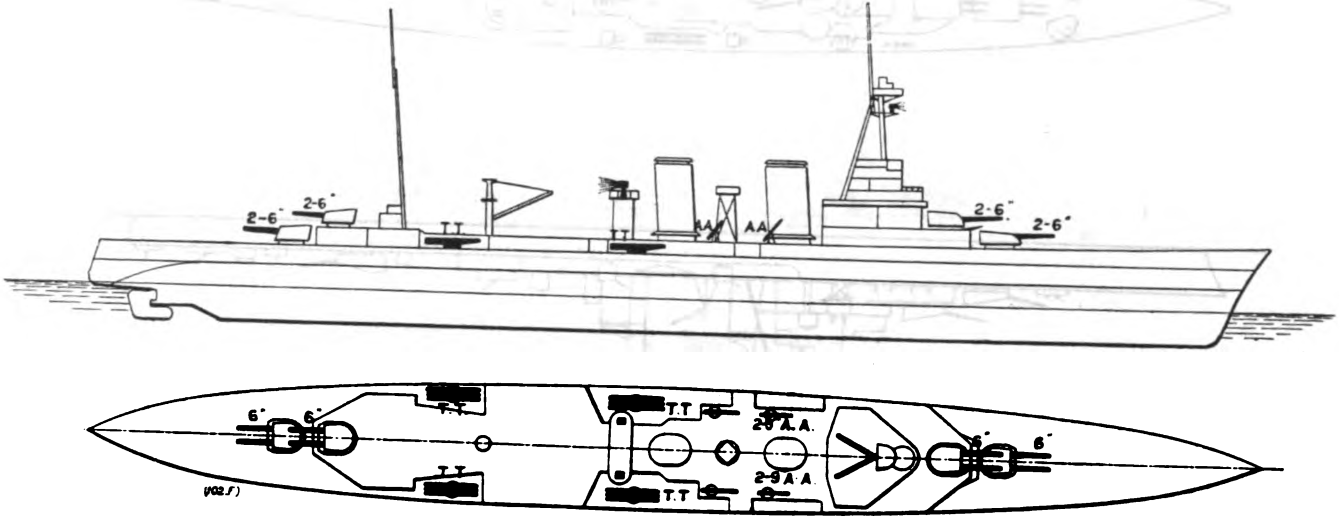


Length (extreme), 589 ft.; 7,600 tons; Completed, 1935-37; Speed, 31 knots.
Armament, 9—6-in.; 8—3·5-in. A.A.; 24—40 mm. A.A.; 16—20 mm. A.A.

FRANCE.

CRUISER.

Duguay-Trouin.

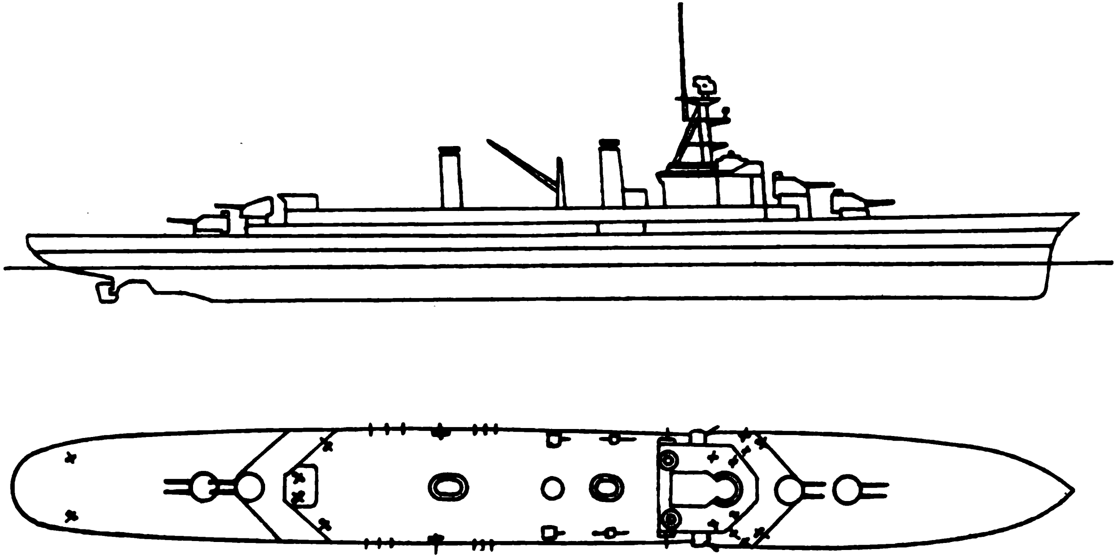


Length (extreme), 594 ft. 10 ins. ; Length B.P., 575 ft. ; 7,249 tons ; Speed, 34 knots. Completed, 1928.
Armament, 8—6·1-in. ; 4—3-in. A.A. ; 6—40-mm. A.A. ; 22—20-mm. A.A.

FRANCE.

TRAINING CRUISER.

Jeanne d'Arc.

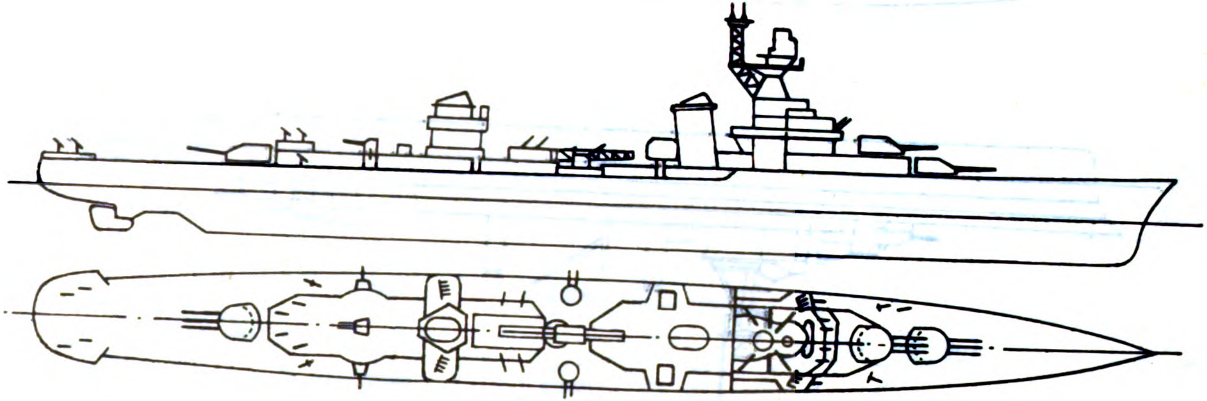


Length, 557 ft. 9 ins.; 6,496 tons; Speed, 26 knots.
Armament, 8—6·1-in.; 4—3-in. A.A.; 14—40-mm. A.A.; 20—20-mm. A.A.

FRANCE.

CRUISER MINELAYER.

Emile Bertin.

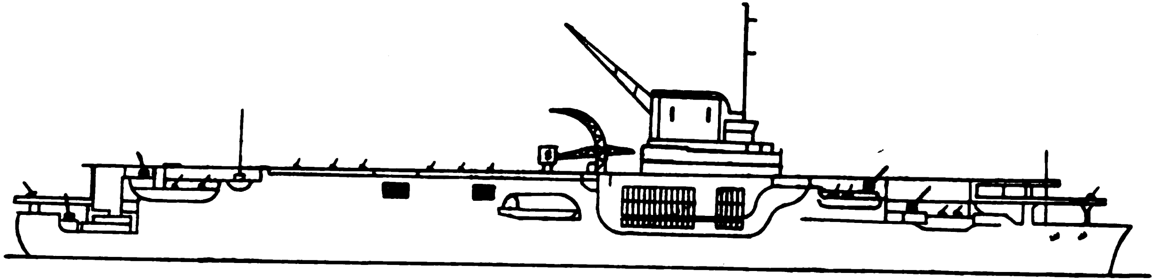


Length, 580 ft. 9 in.; 5,886 tons; Speed, 34 knots.
Armament, 9—6-in.; 8—3·5-in. A.A. Others smaller.

FRANCE.

AIRCRAFT TRANSPORT.

Béarn.

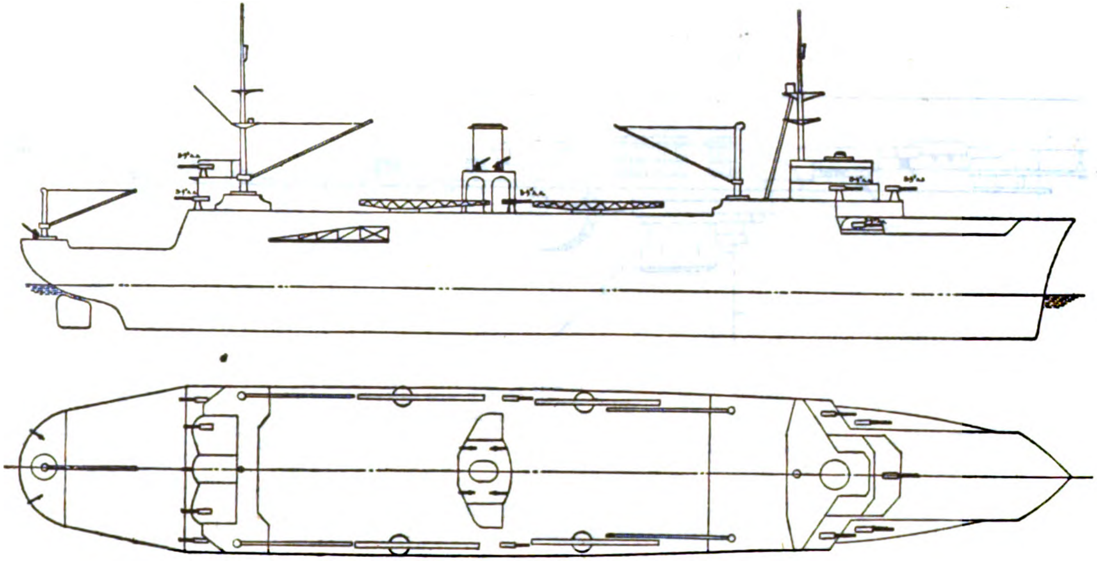


Length, 599 ft.; 22,146 tons; Speed, 21½ knots.
Armament, 4—5-in. A.A.; 28—20-mm. A.A.

FRANCE.

AVIATION TRANSPORT.

Commandant Teste.

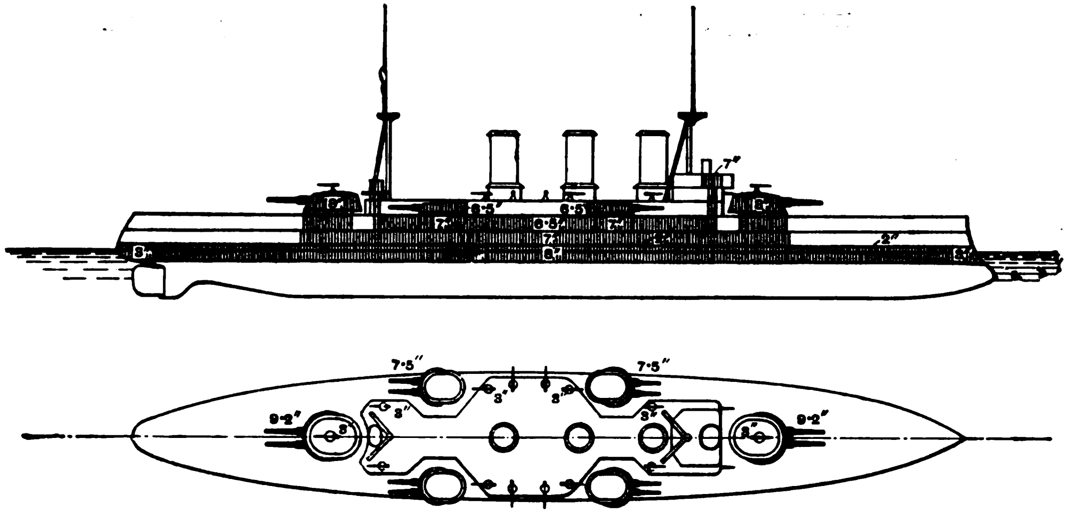


Length (extreme), 548 ft.; 10,000 tons Speed, 20½ knots; Completed, 1932.
Armament, 12—3·9-in. A.A.; 8—3-pr. A.A.; 12 M.; 19 planes.

GREECE.

ARMOURED CRUISER.

Giorgios Averoff.



Length, 462 ft.; 9,301 tons; Speed, 22·5 knots; Completed, 1911. Refitted, 1927.

Armament, 4—9·2-in.; 8—7·5-in.; 16—3-in.; 2—3-in. A.A.; 4—3-pr.; 2 M.; 3 submerged 18-in. torpedo tubes.

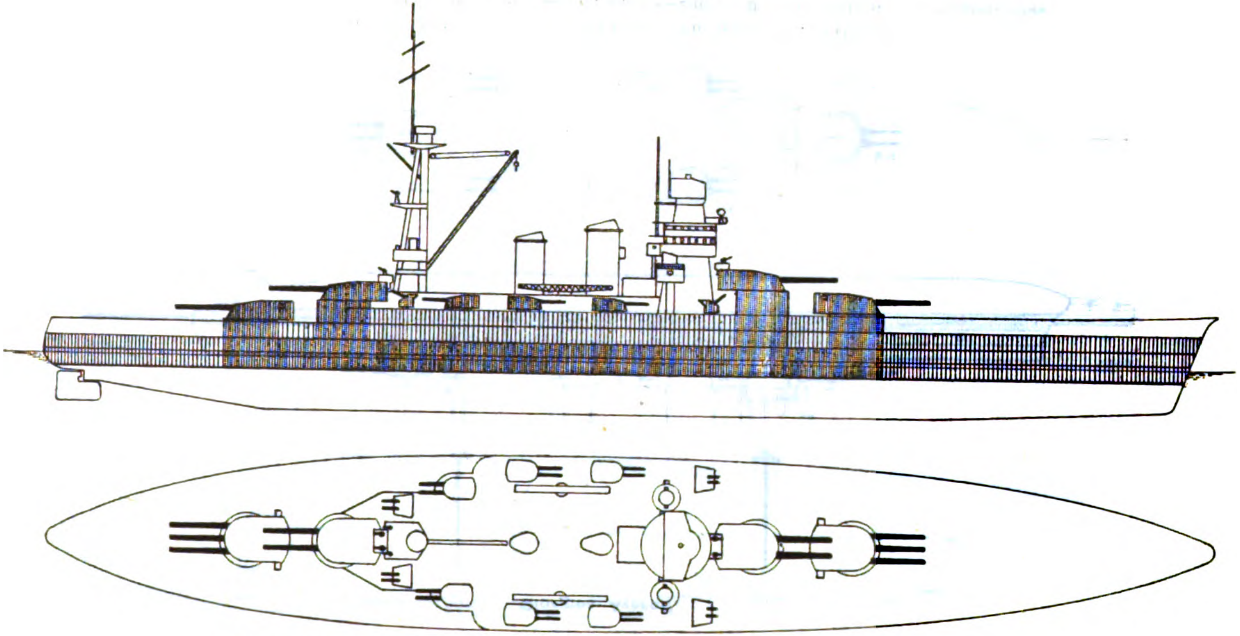
Correction to plan.—Bridgework modified. Control top fitted on foremast. Searchlight and derrick fitted to mainmast.

ITALY.

BATTLESHIPS.

Giulio Cesare. **Andrea Doria.** **Caio Duilio.**

(After modernisation.)



Length (extreme), 611 ft. 6 ins.; 23,622 tons; 27 knots; Completed, 1914–15; Modernised, 1937.

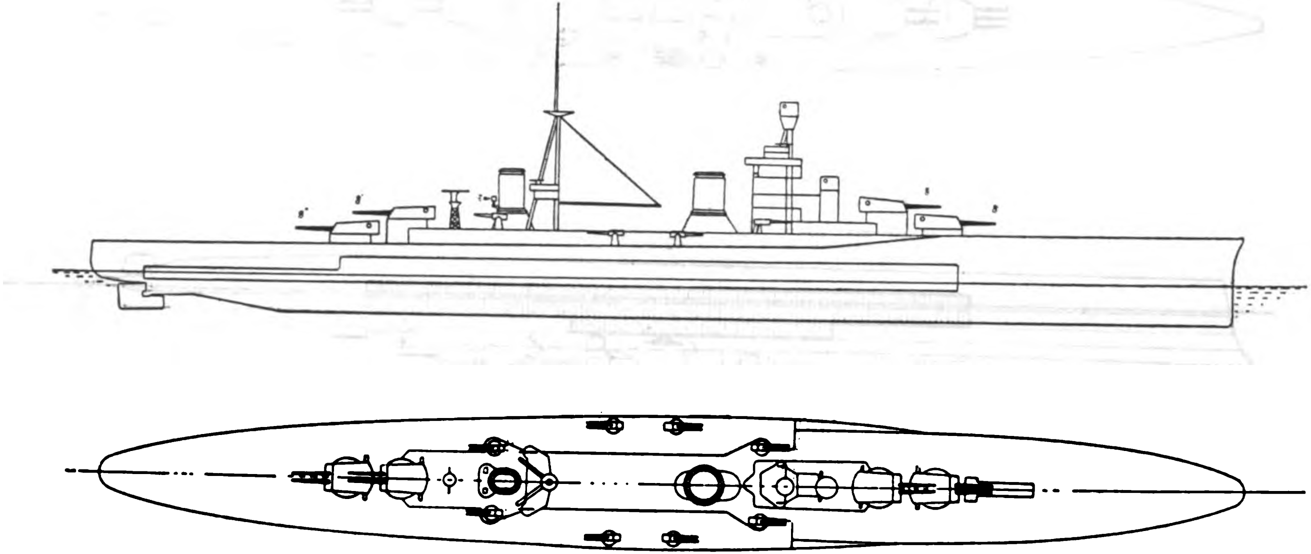
Armament { 10—12·6-in.; 12—4·7-in.; 8—3·9-in. A.A.; 36 A.A. M.G.; 4 aircraft; 2 catapults in Cesare.
{ 10—12·6-in.; 12—5·3 in.; 10—3·5 in. A.A.; 39 A.A. M.G.; 1 aircraft; 1 catapult in Doria and Duilio.

Doria and Duilio have a modified bridge structure and a different arrangement of A.A. guns.

ITALY.

CRUISER.

Gorizia.

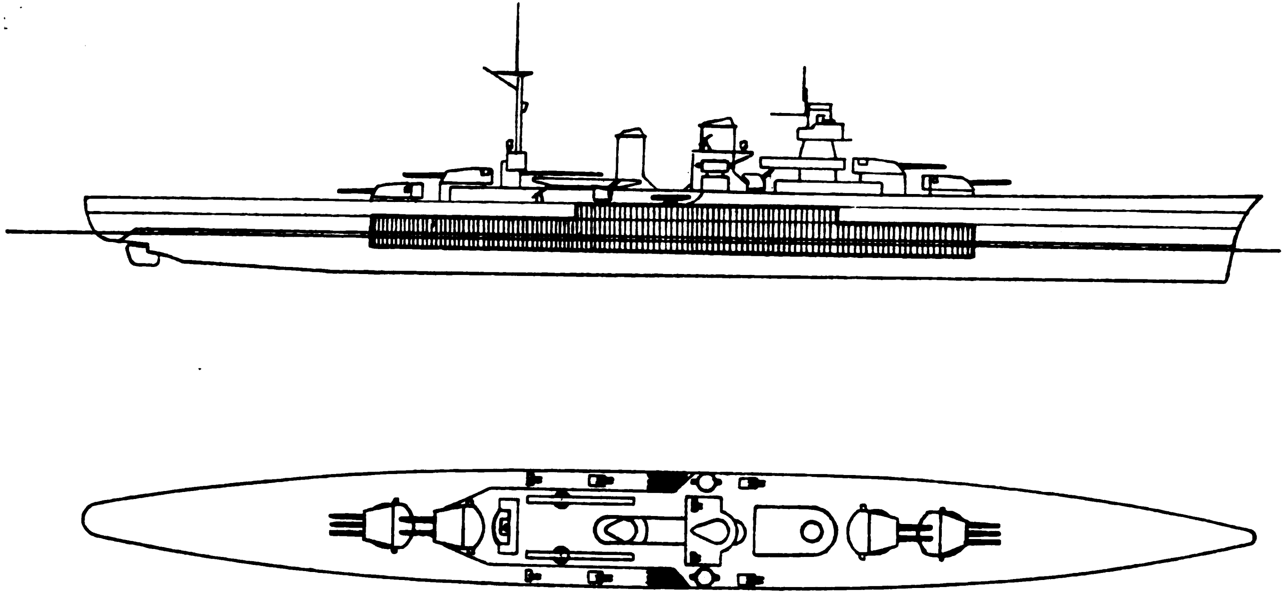


Length (extreme), 599 ft. 9 ins.; 10,000 tons; Speed, 32 knots.
Armament, 8—8-in.; 12—3·9-in.; 8—1·5-in. A.A.; 8—·5 M.A.A.; 1 catapult; 2 aircraft.

ITALY.

CRUISERS.

Luigi di Savoia. **Quiseppe Garibaldi.**



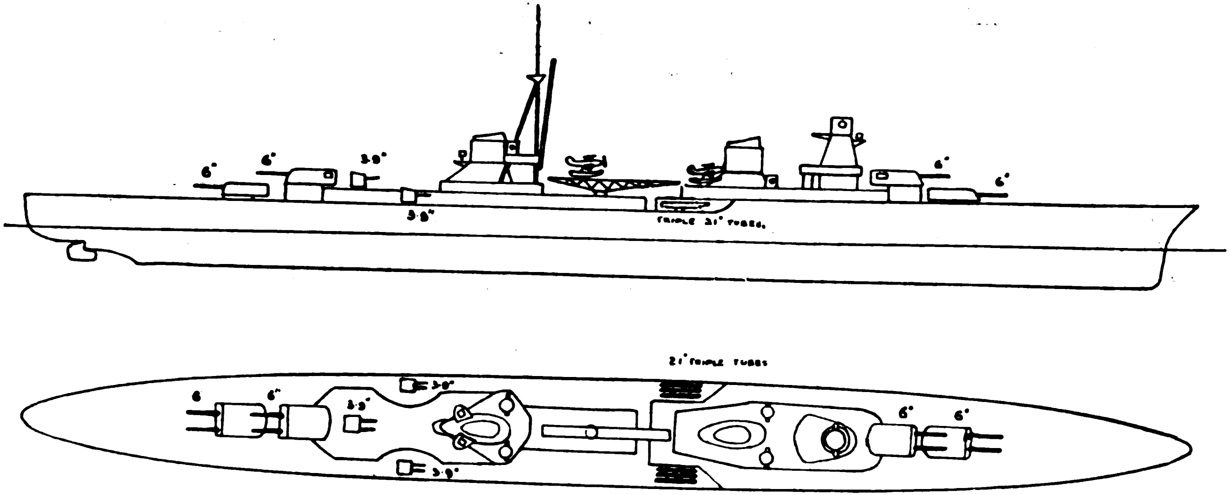
Length (extreme), 613 ft. 9 in.; Standard displacement, 7874 tons; Speed, 35 knots; Completed, 1936.
Armament, 10—6 in.; 8—3·9 in. A.A.; 8—1·5 in. A.A.; 6—21 in. torpedo tubes; 2 catapults; 4 aircraft.

ITALY.

CRUISERS.

"*Attendolo*" *Class.*

Eugenio di Savoia. **Filiberto Duca d'Aosta.**

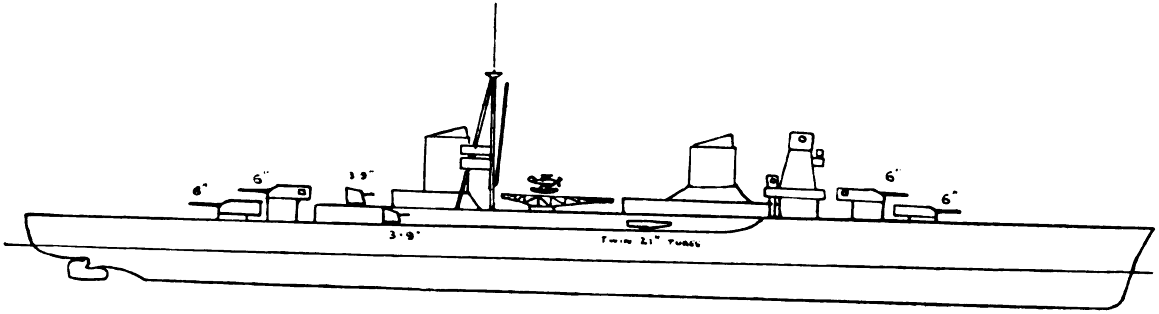


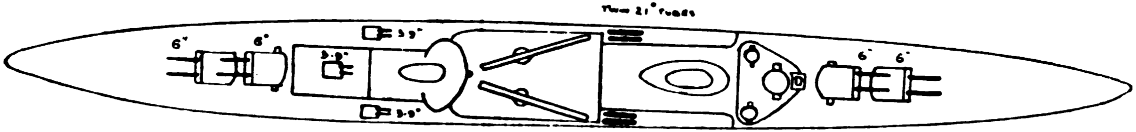
Length (extreme), 610 ft. 3 ins.; 7,283 tons; Speed, 36½ knots.
Armament, 8—6-in.; 6—3·9-in.; 8—1·5-in A.A.; 8—·5-in. A.A.; 2 triple 21-in. torpedo tubes; 1 catapult; 3 aircraft.

ITALY.

CRUISER.

Montecuccoli.



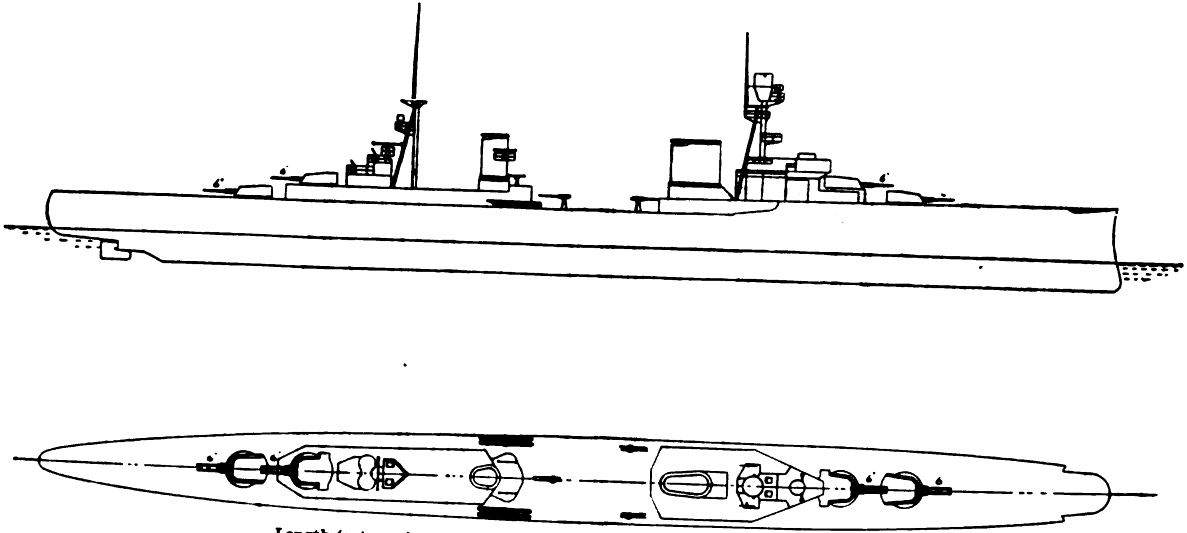


Length (extreme), 597 ft. 9 ins.; 6,941 tons; Speed, 37 knots: Completed, 1935.
Armament, 8—6-in.; 6—3·9-in. A.A.; 8—1·5-in. A.A.; 8—·5-in. A.A. M.G.; 2 twin 21-in. torpedo tubes; 1 catapult; 2 aircraft.
Correction to plan.—1 catapult fitted on M.L.

ITALY.

CRUISER.

Luigi Cadorna.



Length (extreme), 554 ft. 6 ins., 5,008 tons; Speed, 37 knots; Completed, 1933.
Armament, 8—6-in.; 6—3·9-in. A.A.; 8—1·5-in. A.A.; 8—·5 in. A.A. M.G.; 4 torpedo tubes 21-in.;
1 catapult and 2 seaplanes.

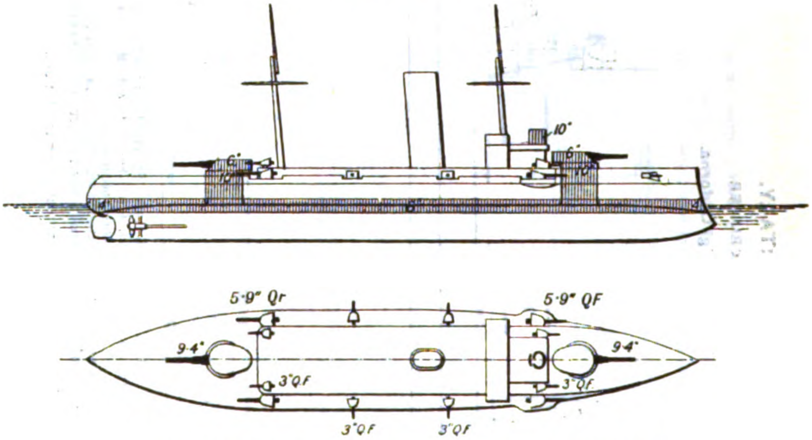
Corrections to plan: The bridge and foremast have been modified. The after twin 3·9-in. A.A. gun is at the superstructure level on a raised platform. Derrick fitted on foreside of mainmast, which has been moved forward of after funnel.

Torpedo tubes are abreast forward funnel.

NETHERLANDS.

COAST DEFENCE SHIP.

Hertog Hendrik.

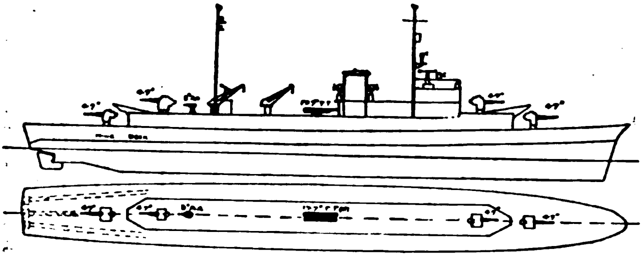


Length, 317 ft.; 4,371 tons; Speed, 16½ knots; Completed, 1904.
Armament, 2—9·4-in.; 4—5·9-in.; 2—3-in.; 6—1 pr.; 2 M.
Correction.—Has been rearmed with 8—4-in.; 4—1·5-in.

NORWAY.

MINELAYER AND TRAINING SHIP.

Olav Tryggvason.



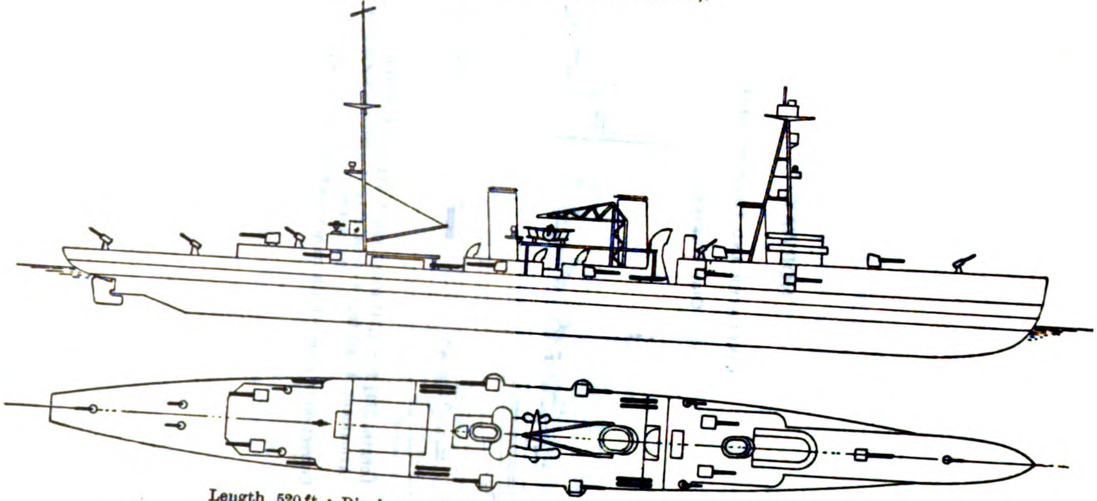
Length, 319½ ft.; 1,747 tons; speed, 21½ knots; Completed, 1934.
Armament, 4—4·7-in.; 1—3-in. A.A.; 2—17·7-in. torpedo tubes. 280 mines.

Correction to plan.—Both cranes are fitted abreast the mainmast.

SOVIET UNION.

CRUISER.

Krasny Krym (*ex*-Profintern).

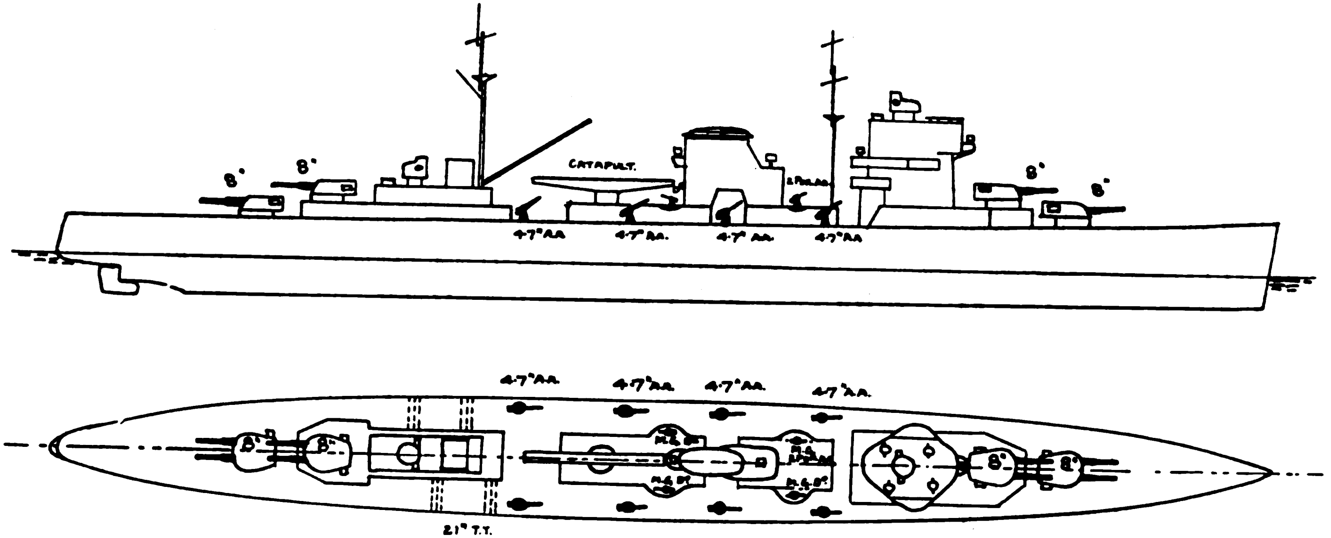


Leugth, 520 ft.; Displacement, 7,200 tons; Speed, 29½ knots; Completed, 1925.
Armament, 15—5·1-in.; 4—4-in.; 4—3-in. A.A.; 4 M.; 12—21-in. torpedo tubes; 100 mines; 2 seaplanes.

SPAIN.

CRUISER.

Canarias.

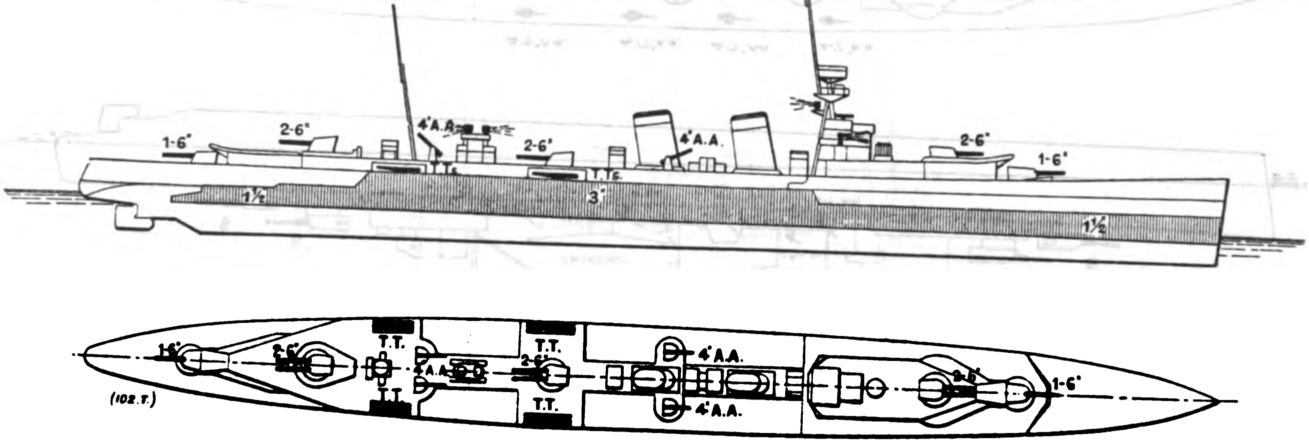


Length (extreme), 636 ft. ; 10,000 tons ; 33 knots ; Completed, 1934.
Armament, 8—8-in. ; 8—4·7-in. A.A. ; 8—2-pr. A.A. ; 12—21-in. torpedo tubes ; 1 catapult ; 2 aircraft.
Masts removed.

SPAIN.

CRUISERS.

Galicia (ex-Libertad, ex-Principe Alfonso). Almirante Cervera. Migue de Cervantes.

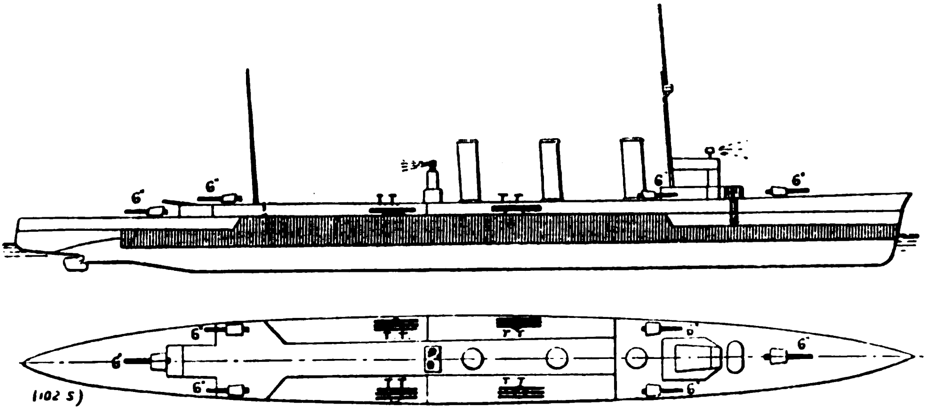


Length (extreme), 579 ft. 6 ins.; 7,475 tons; Speed, 33 knots. Completed 1927-1930.
Armament, 8—6-in.; 4—4-in. A.A.; 2—3 pr.; 1 M.; 4 triple above-water torpedo tubes (21-in. torpedoes).
Corrections to plan.—The mainmast is tripod and has been moved forward. Fore topmast and topgallant mast removed.

SPAIN.

LIGHT CRUISER.

Mendez Nuñez.



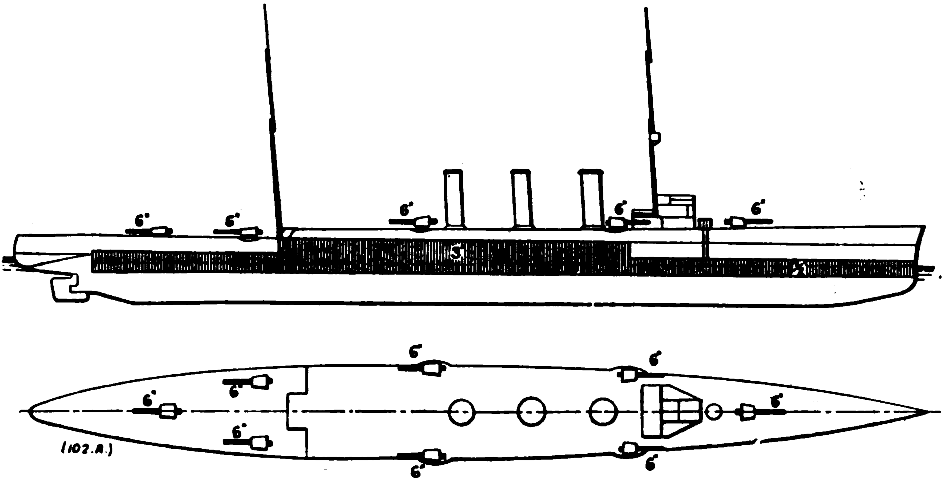
Length (extreme), 462 ft. ; 4,509 tons ; Speed, 29 knots. Completed, 1924.
Armament, 6—6-in. ; 4—1·9-in. A.A. ; 4 M. ; 2 above-water triple torpedo tubes (21-in. torpedoes).

NOTE.—The armour belt is 3 ins. thick, tapering to 1½ ins. at the ends.

Corrections to plan.—The foremast is tripod. Fore topgallant mast is fitted.
A.A. Armament is fitted between second funnel and mainmast. Searchlight platform added round after funnel.

LIGHT CRUISER.

Navarra (*ex*-Republica, *ex*-Reina Victoria Eugenia).



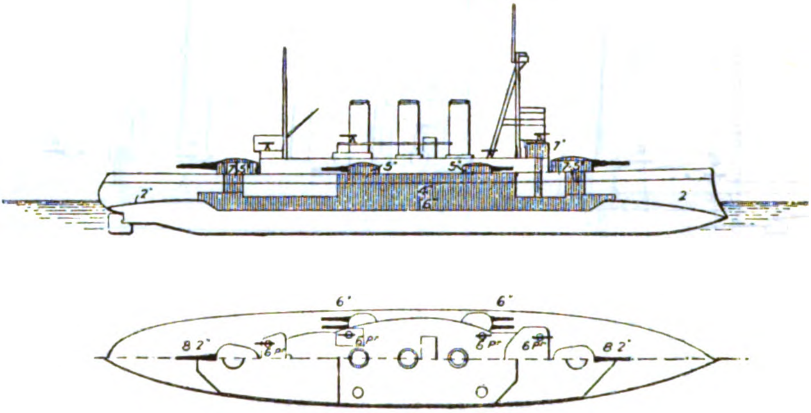
Length (extreme), 462 ft. ; 4,857 tons ; Speed, 25½ knots ; Completed, 1923.
Armament, 8—6-in. ; 4—3·5-in. A.A. ; 4 M. ; 1 L.

Correction to plan.—Foremost funnel and masts removed. Tower built in place of foremast and superstructure built in place of mainmast and fitted with pole masts. A.A. Armament fitted in way of funnels. Upper deck extends further aft.

SWEDEN.

BATTLESHIP.

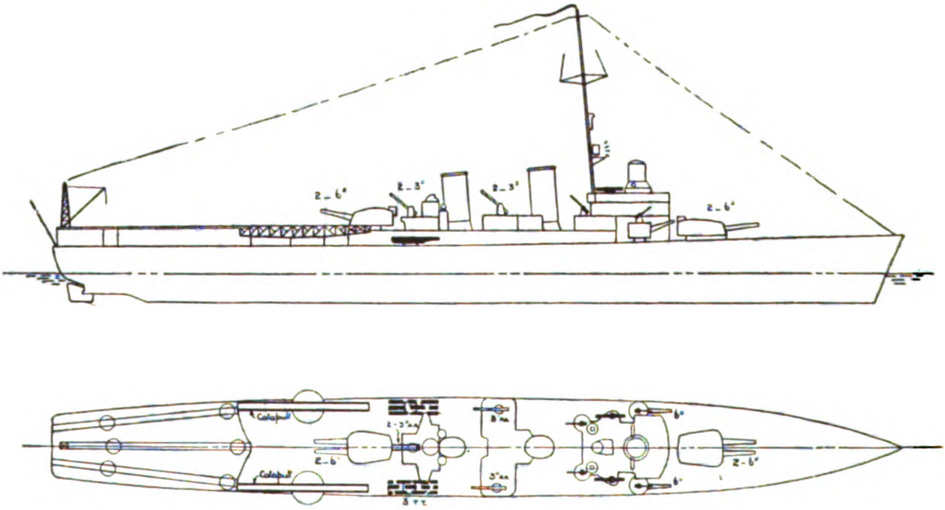
Oscar II.



Length, 313·6 ft. ; 4,250 tons ; Speed, 18 knots ; Completed, 1907.
Armament, 2—8·3-in. ; 8—5·9-in. ; 8—6-pr. ; 1—1-pr. ; 2 submerged 18-in. torpedo tubes.
Mainmast removed.

AIRCRAFT CRUISER.

Gotland.

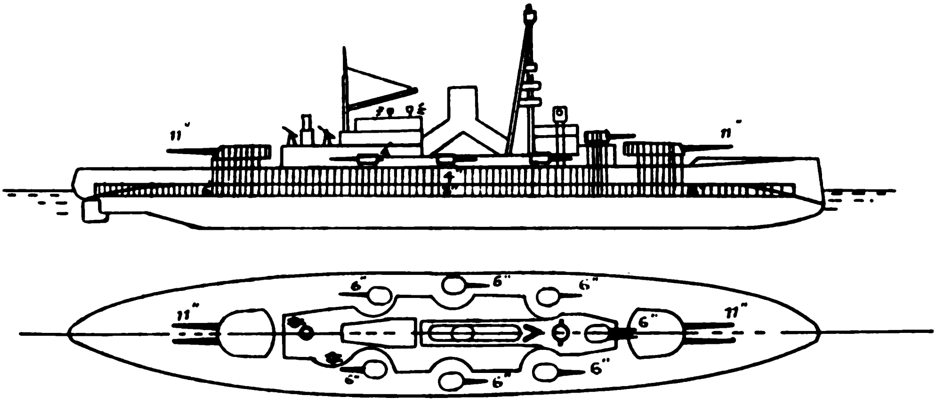


Length, 442 ft. ; 4,700 tons ; Speed, 27 knots ; Completed, 1934.
Armament, 6—6-in. ; 4—3-in. A.A. ; 4 M. ; 6—21-in. torpedo tubes ; 1 catapult ; 11 seaplanes ; 100 mines.
Correction to plan.—Has been reconstructed as an A-A- cruiser.

SWEDEN.

COAST DEFENCE SHIPS.

Gustav V. **Sverige.**
(As reconstructed 1924–29.)

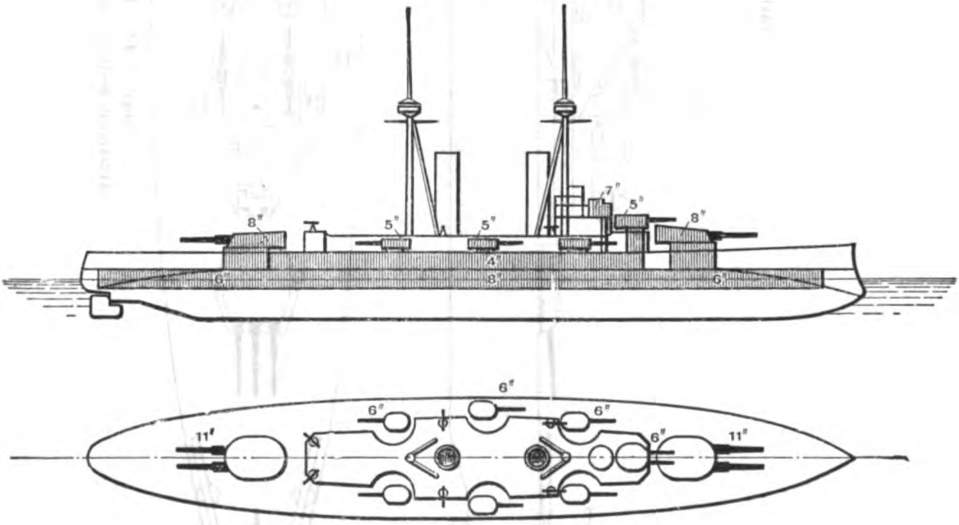


Length, 396·7 ft.; Sverige, 6,899 tons; Gustav V, 7,100 tons; Speed, 23 knots; Completed 1917-21.
Armament, 4—11-in.; 6—5·9-in.; 4—3-in.; 2—6-pr.; 6 M.
Correction to plan.—Mainmast removed. In Sverige two funnels are fitted, the after one being vertical and the forward one bent.

SWEDEN.

COAST DEFENCE SHIP.

Drottning Victoria.



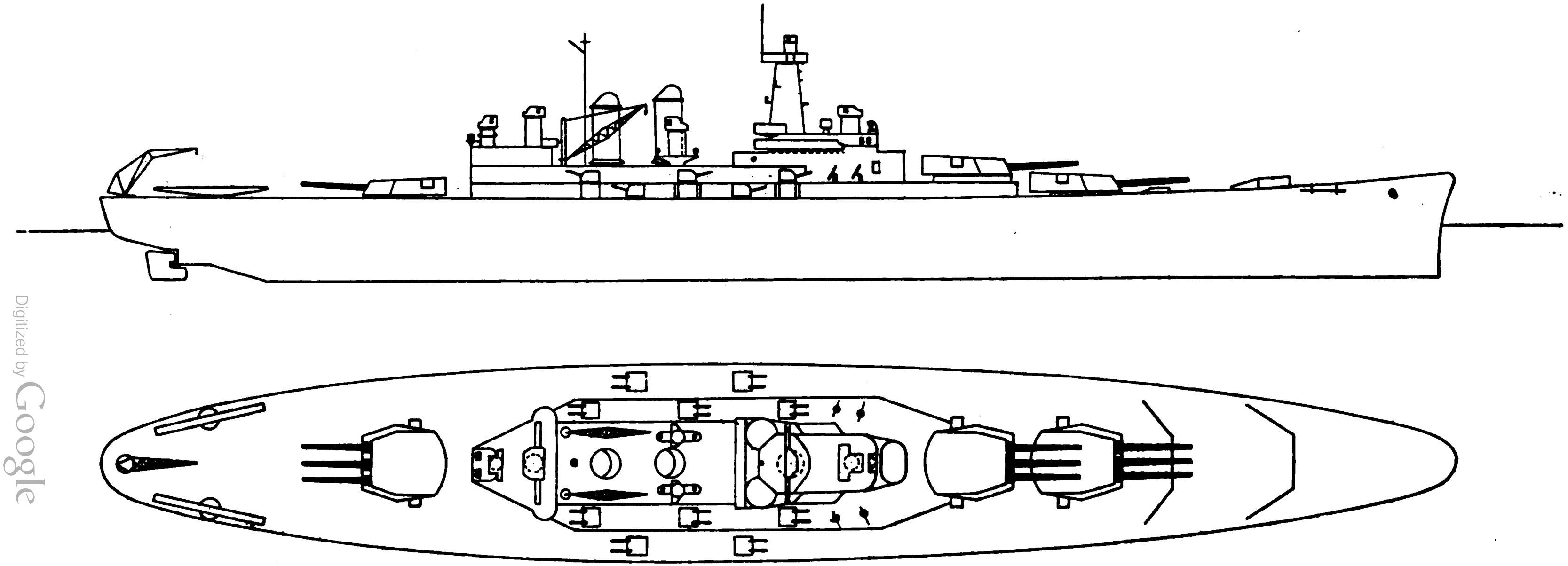
Length, 396·7 ft.; 7,100 tons; Speed, 23 knots; Completed, 1921.
Armament, 4—11-in.; 8—5·9-in.; 4—3-in.; 2—6-pr.; 9 M.
Mainmast removed. Searchlight platform and A.A. guns fitted abaft after funnel.

UNITED STATES.

BATTLESHIP.

"North Carolina" *Class.*

Washington. **North Carolina.**

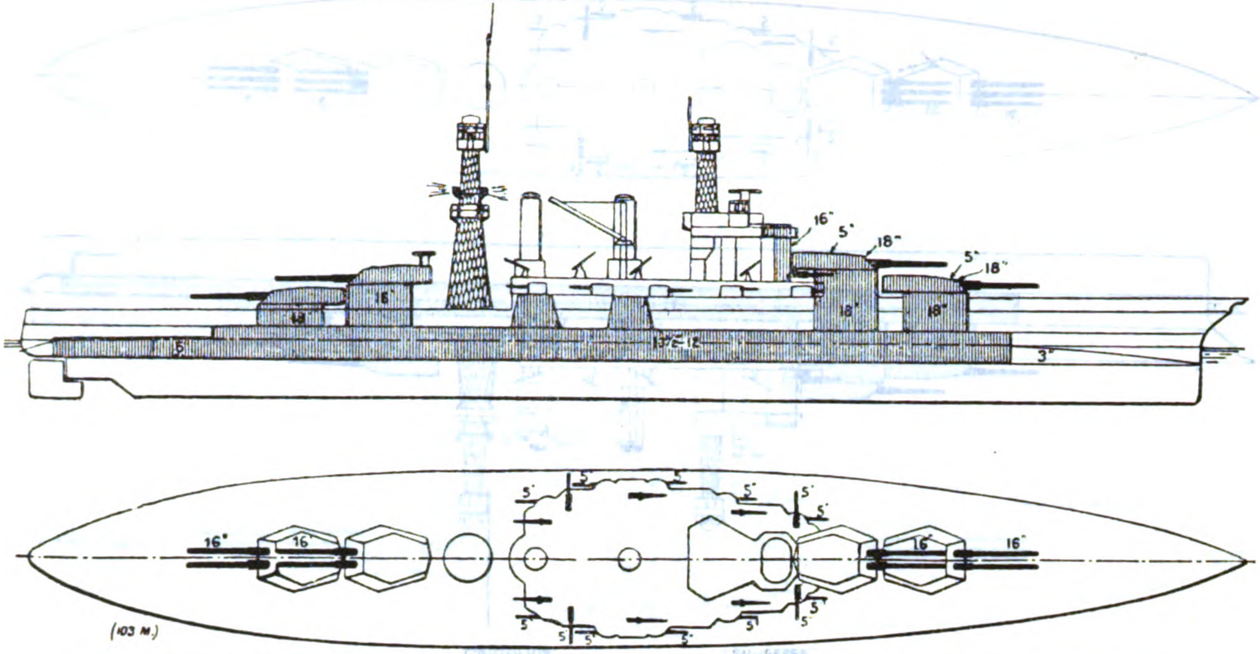


Length, 729 ft.; 35,000 tons; speed, 27 knots. Completed 1941.
Armament, 9—16-in. 20—5-in.; many smaller A.A.; 3 aircraft; 2 catapults.

UNITED STATES.

BATTLESHIPS.

Colorado. **Maryland.** **West Virginia.**



Length (extreme), 624 ft. ; Length W.L., 600 ft. ; Speed, 21 knots ; 31,500–32,500 tons ; Maryland, completed, 1921 ; Colorado and West Virginia, completed, 1923.

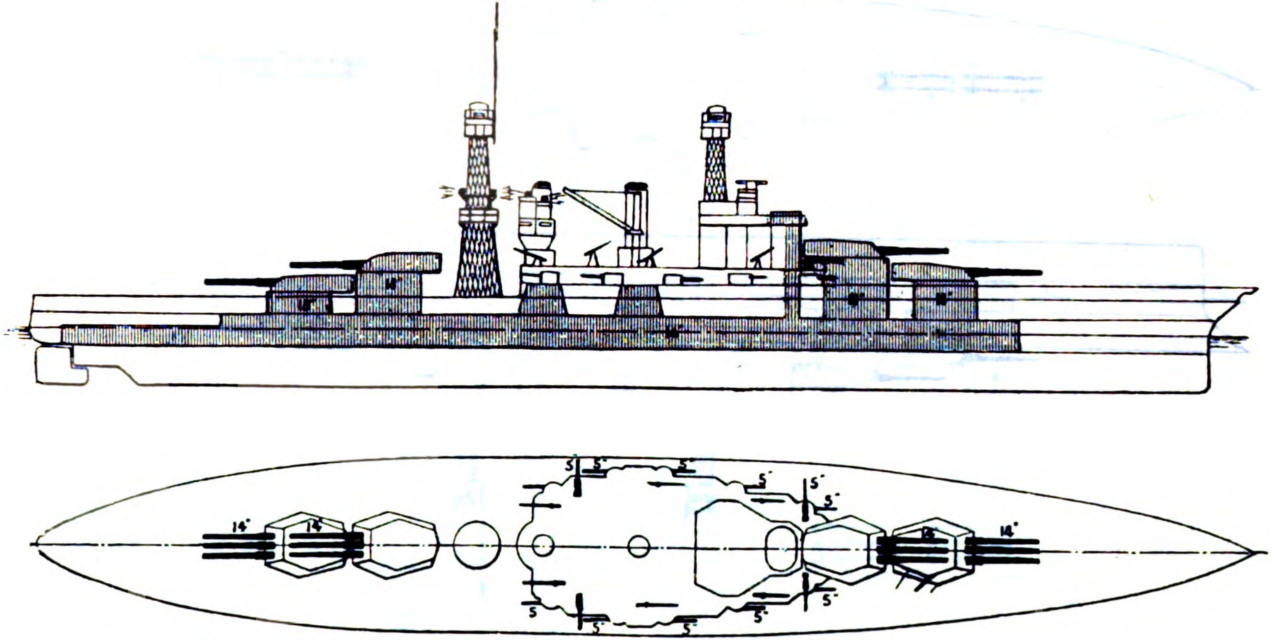
Armament, 8—16-in. ; 12—5-in. ; 8—5-in. A.A. ; many small A.A. guns ; 2 submerged 21-in. torpedo tubes ; 2 catapults ; 3 aircraft.

NOTE.—Appearance has been drastically altered as a result of wartime reconstruction.

UNITED STATES.

BATTLESHIPS.

California. **Tennessee.**

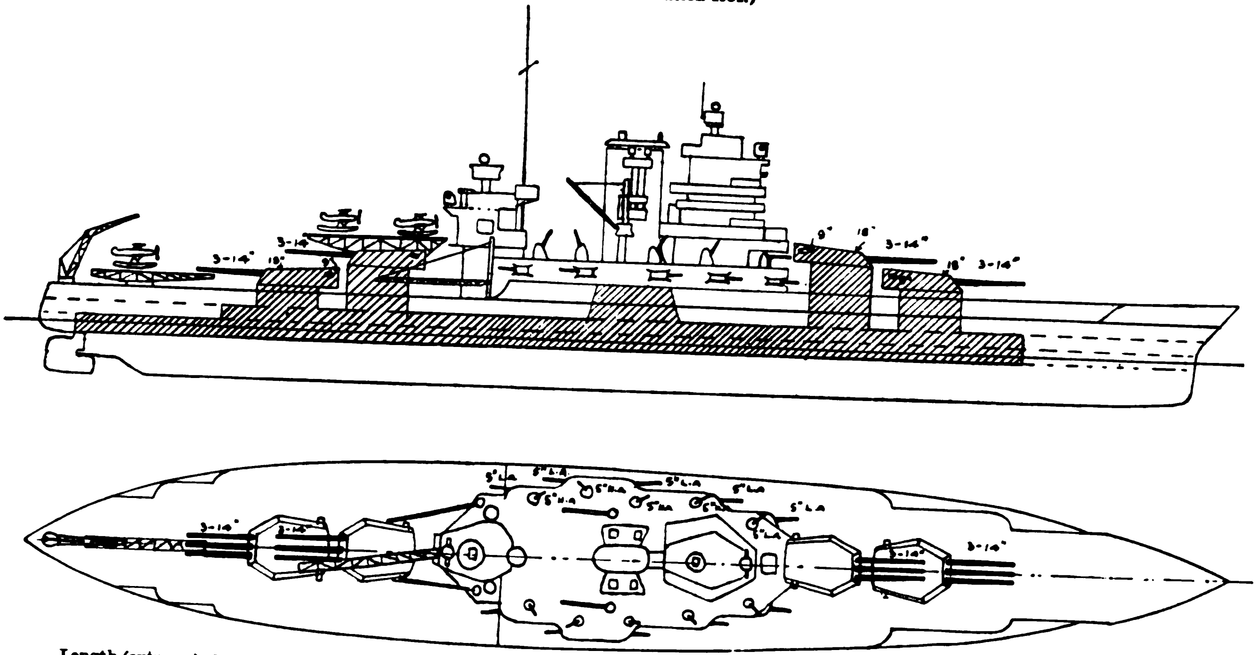


Length (extreme), 624 ft.; Length W.L., 600 ft.; Speed, 21 knots; 32,600–32,300 tons; Completed, 1920–21.
Armament, 12—14-in.; 16—5-in.; many small A.A. guns; 2 submerged 21-in. torpedo tubes.
2 catapults (one right aft on quarter deck and one "X" turret); 3 seaplanes.
Extensively reconstructed after damage received at Pearl Harbour, and appearance drastically altered.

UNITED STATES.

BATTLESHIPS.

Idaho. **New Mexico.** **Mississippi.**
(After modernisation 1934.)

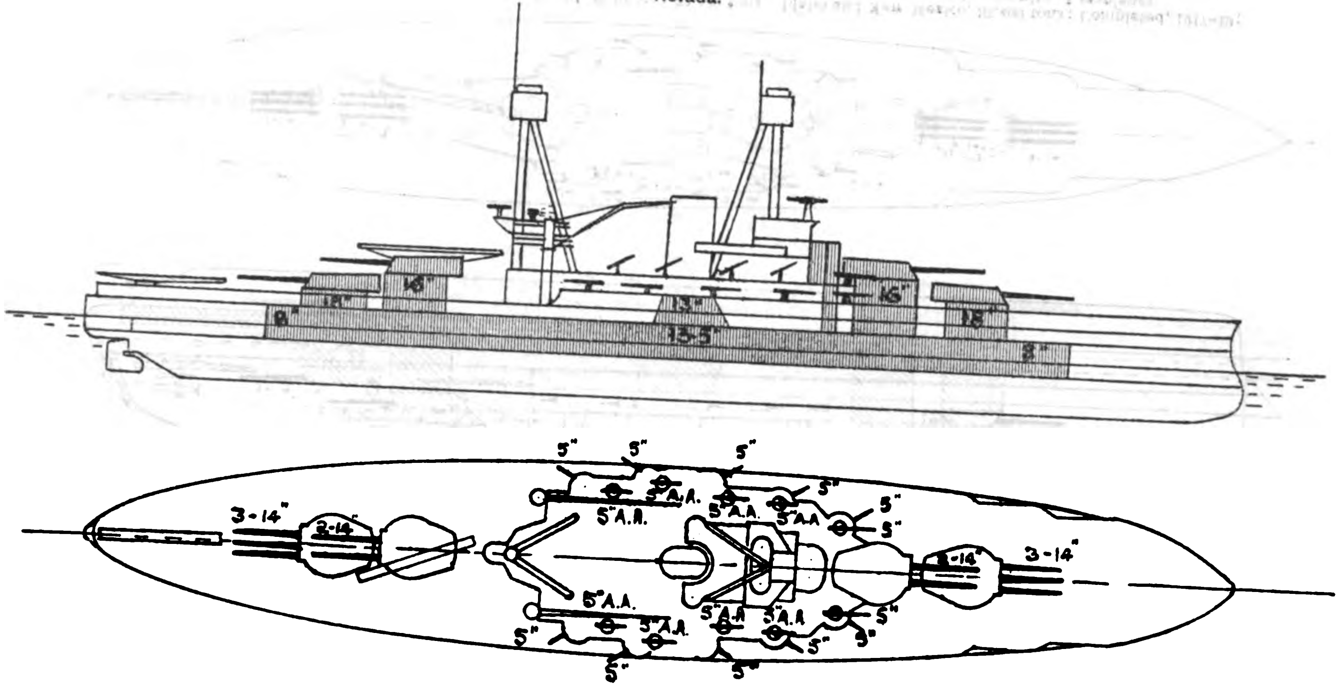


Length (extreme), 624 ft.; Length, W.L., 600 ft.; Speed, 21 knots; 33,400 tons; Idaho and New Mexico, 33,400 tons; Completed, 1917–19; Modernised, 1931–4. Armament, 12—14-in.; 6—5-in.; 8—5-in. A.A.; many small A.A. guns; 2 catapults; 3 seaplanes.

UNITED STATES

BATTLESHIPS.

Nevada.



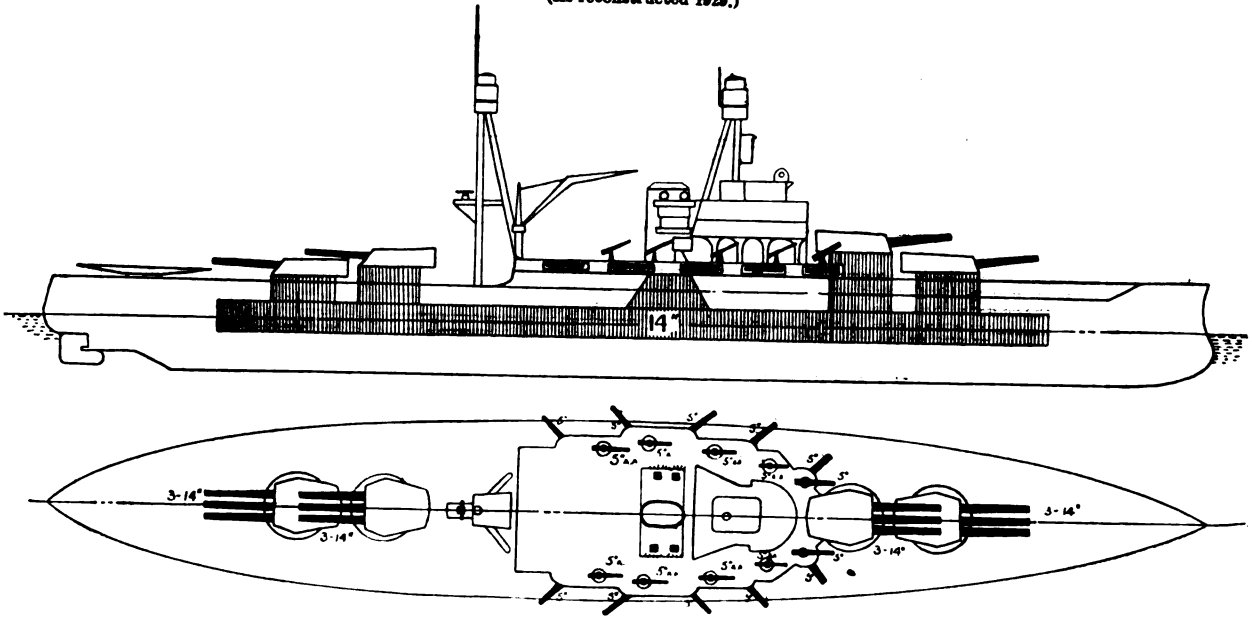
Length (extreme), 583 ft.; Length W.L., 575 ft.; Speed, 20·5 knots; 29,000 tons.
Armament, 10—14-in.; 16—5-in.; many smaller A.A. guns; 2 catapults; 3 aeroplanes.
Correction to plan.—Tripod mainmast has been removed and superstructure increased.
5-in. guns are in twin mounts.

UNITED STATES.

BATTLESHIP.

Pennsylvania.

(As reconstructed 1929.)



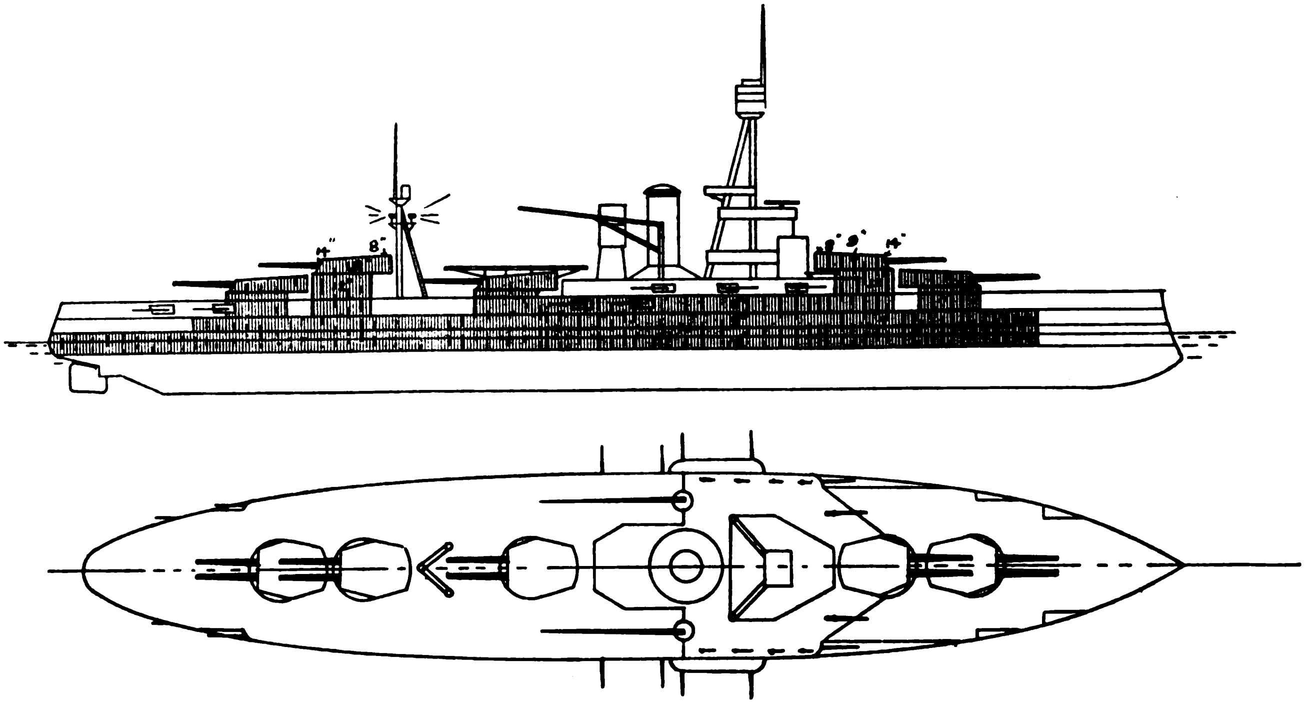
Length (extreme), 608 ft.; Length B.P., 596 ft.; Speed, 21 knots; 33,100 tons; Completed, 1916. Armament, 12—14-in.; 16—5-in.; many smaller A.A. guns; 2 catapults; 3 aircraft.
Corrections to plan.—Catapults fitted on "X" turret and quarter deck. Crane fitted at stern. Mainmast replaced by a built-up structure. 5-in. guns in twin mountings.

UNITED STATES.

BATTLESHIPS.

New York. **Texas.**

(As reconstructed 1927.)

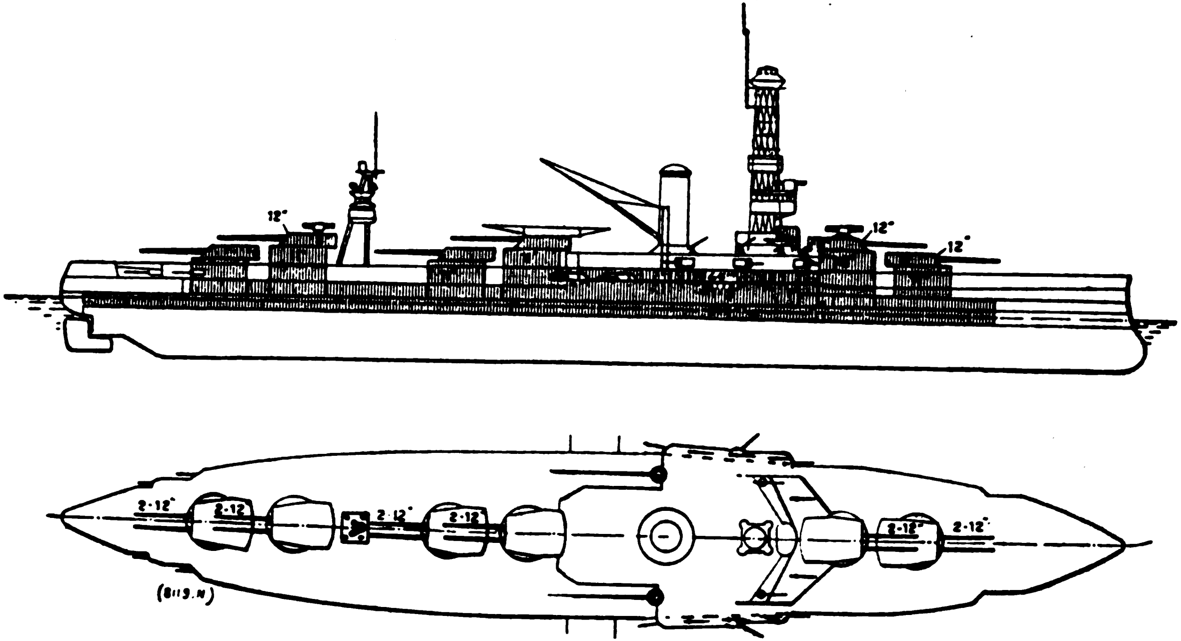


Length (extreme), 573 ft.; Length W.L., 566 ft.; Speed, 21 knots; 27,000 tons; Completed, 1914.
Armament, 10—14-in.; 6—5-in.; 8—3-in. A.A.; many smaller A.A. guns; 1 catapult; 3 aircraft.
Corrections to plan.—Mastheads have been modified.

UNITED STATES.

BATTLESHIP.

Arkansas.



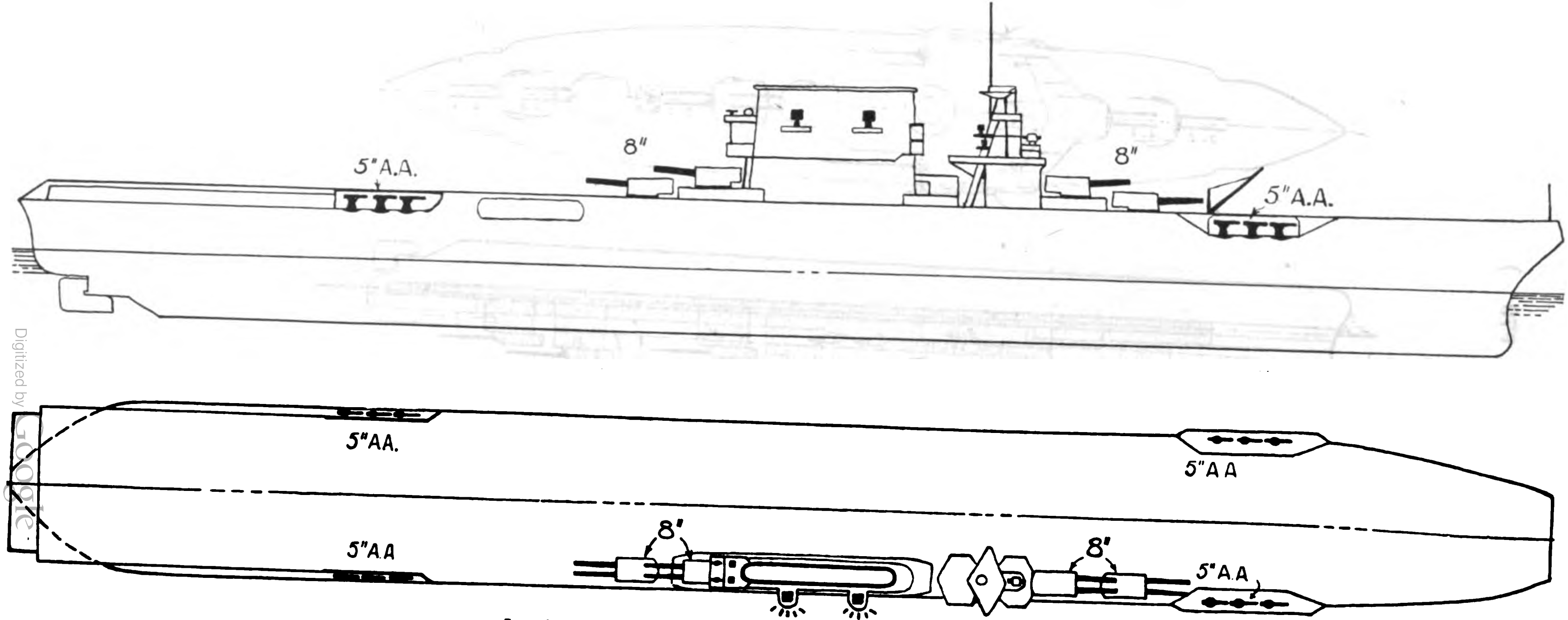
Length (extreme), 562 ft.; Length, W.L., 555 ft.; Speed, 20·5 knots; 26,100 tons; Completed, 1912.
Armament, 12—12-in.; 6—5-in.; 8—3-in. A.A.; many smaller A.A. guns: 1 catapult; 3 aircraft.
Foremast replaced by tripod and bridge structure increased.

Wyoming, a sister ship, has been demilitarised and converted to a training ship.

UNITED STATES.

AIRCRAFT CARRIER.

Saratoga.



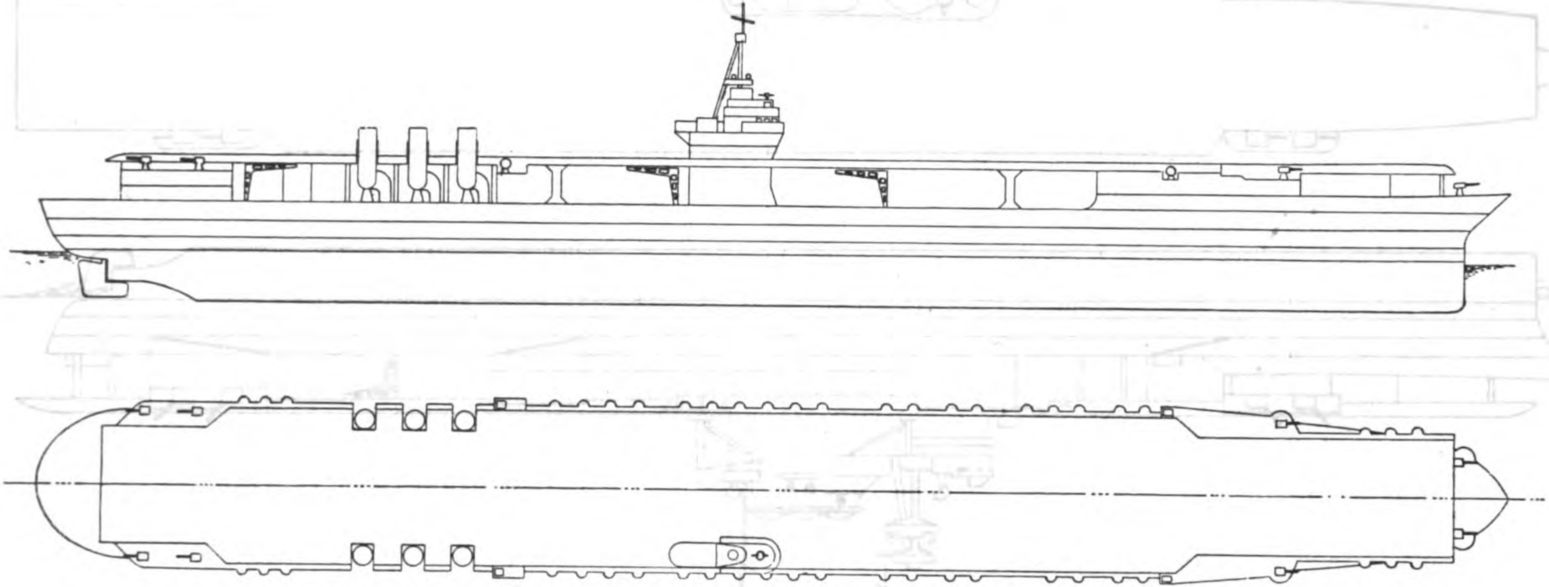
Length (extreme), 909½ft. ; 33,000 tons ; Speed, 34 knots ; Completed, 1927.
Armament, 16—5-in. A.A. ; many small A.A. guns ; Operates about 80 aircraft ; 1 catapult.

Correction to plan.—8-in. guns have been replaced by 5-in. in twin turrets.

UNITED STATES.

AIRCRAFT CARRIER.

Ranger.



Length (overall), 769 ft.; Length W.L., 728 ft.; Displacement, 14,500 tons; Speed, 29¼ knots. Completed, 1934.

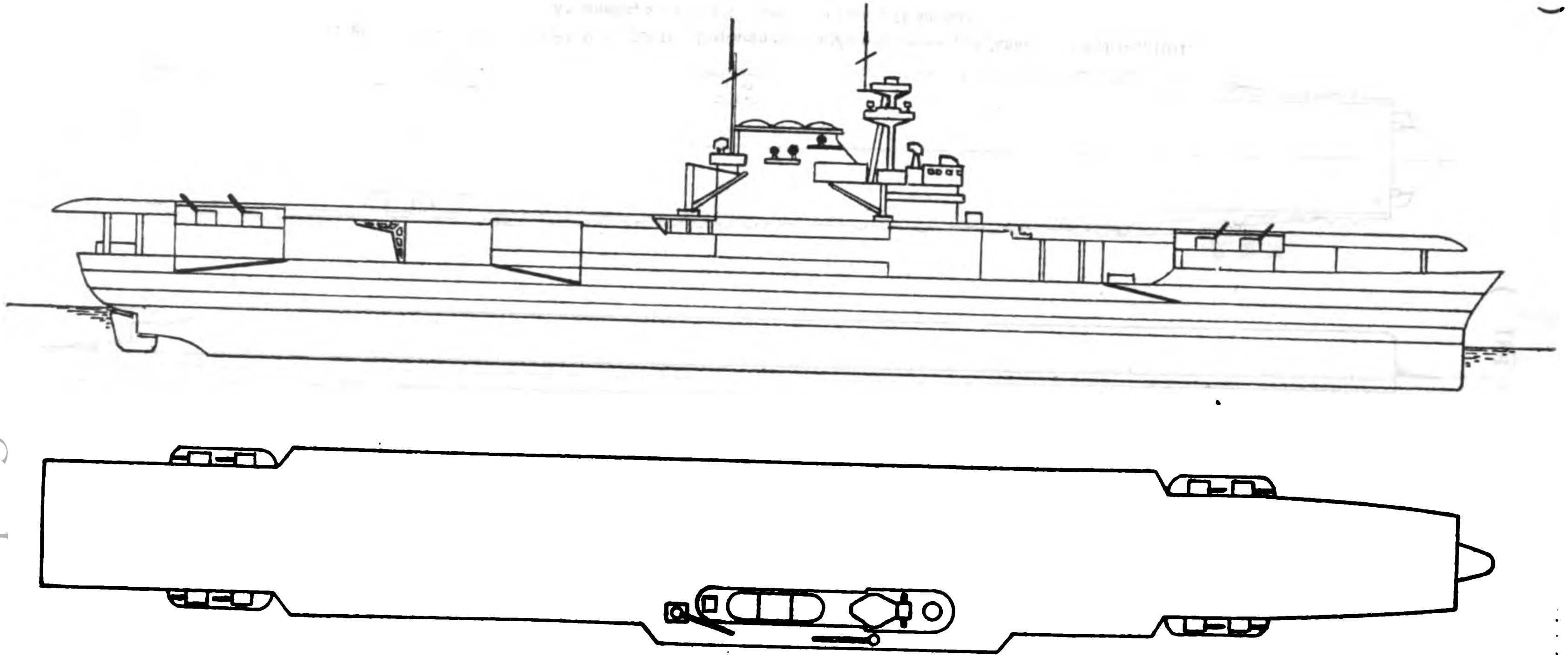
Armament, 8—5-in. A.A.; many small A.A.; 76 aircraft.

NOTE.—The funnels can be swung outboard. Signal masts fitted at ends of flight deck.

UNITED STATES.

AIRCRAFT CARRIER.

Enterprise.

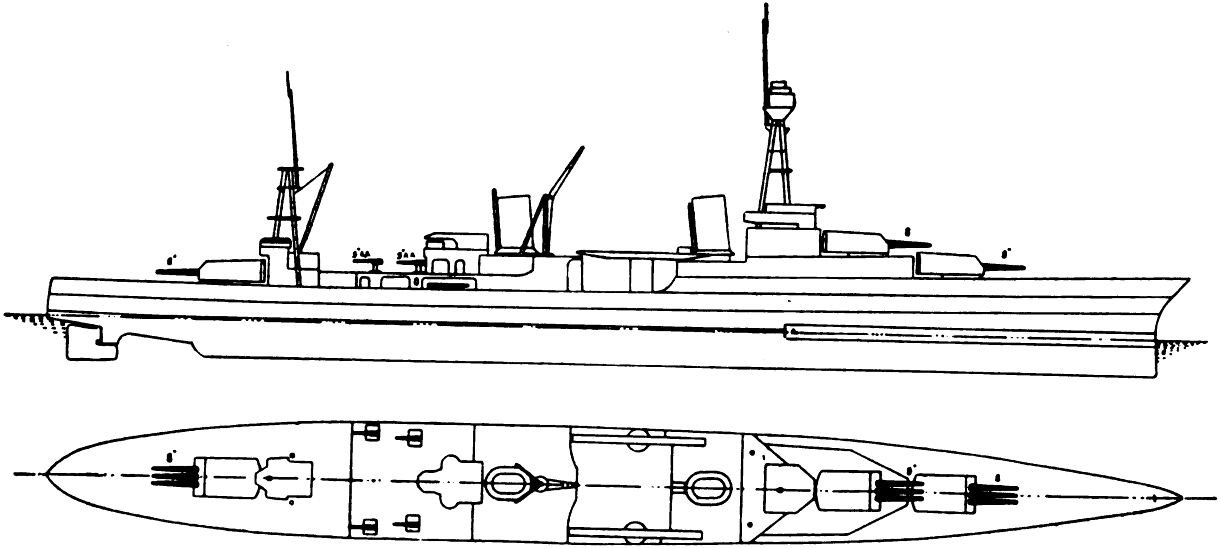


Length (Extreme), 809½ ft.; 19,900 tons; Speed, 34 knots; completed 1938.
Armament, 8—5-in. A.A.; many small A.A.; 80 aircraft; 1 catapult.

UNITED STATES.

CRUISERS.

Chester. **Augusta.** **Louisville.** (*"Chester" Class.*)



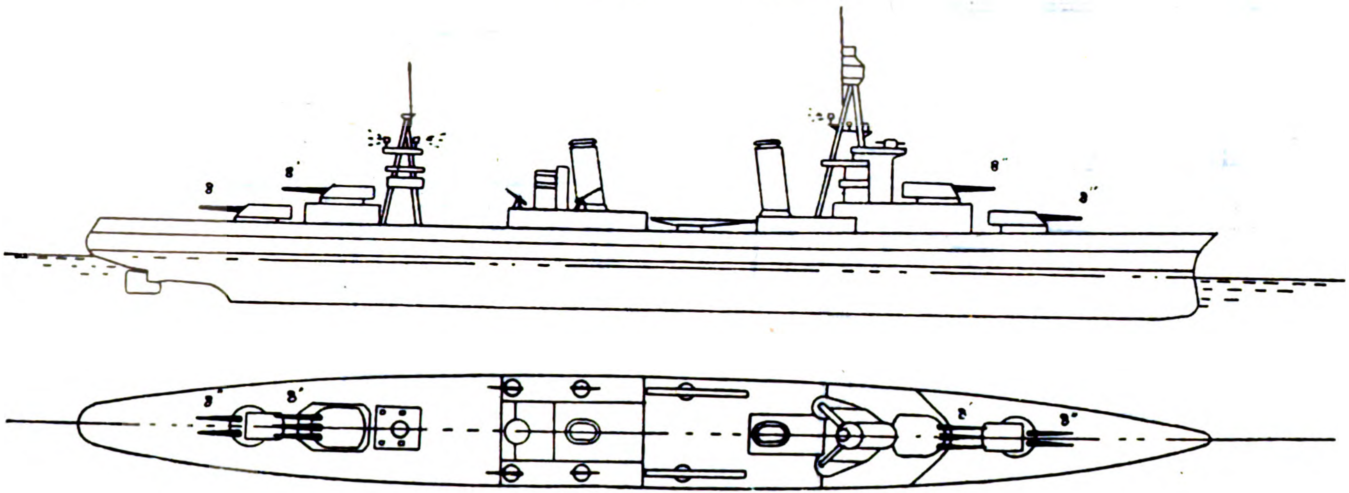
Length (extreme), 600¼ ft.; 9,050–9,300 tons; Speed, 32·5 knots; Completed, 1930–31. Armament, 9—8-in.; 8—5-in. A.A.; many small A.A. guns; 2 catapults; 4–6 seaplanes.

UNITED STATES.

CRUISERS.

"*Pensacola*" *Class.*

Salt Lake City. Pensacola.



Length (extreme), 585¼ ft. ; 9,100 tons ; **Speed**, 32·7 knots ; Completed, 1930.
Armament, 10—8-in. ; 8—5-in. A.A. ; many small A.A. guns ; 2 catapults ; 4 seaplanes.

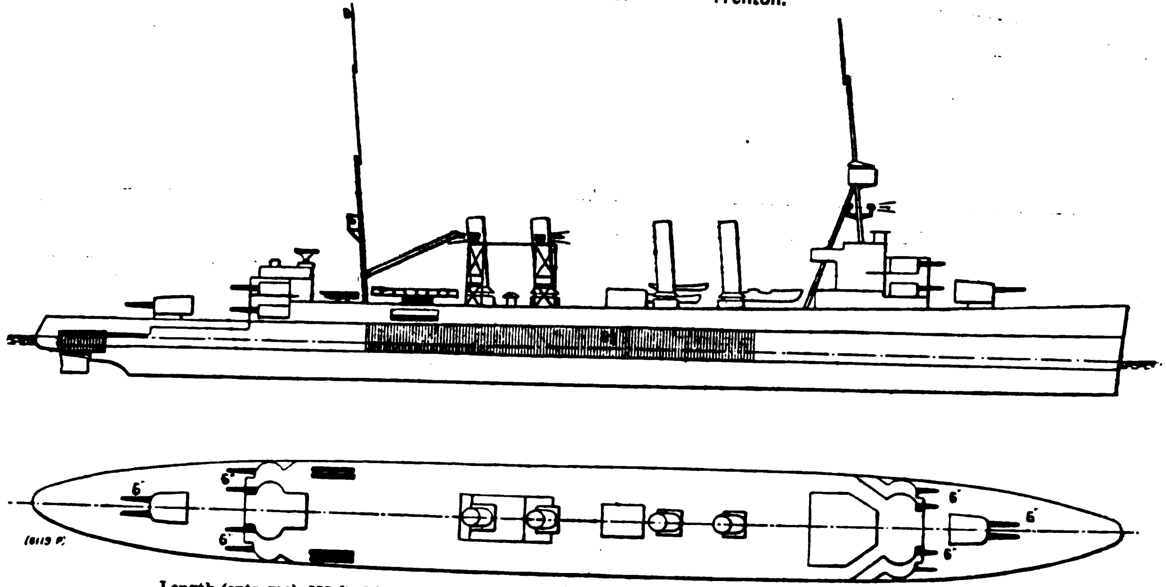
Corrections.—Tripod mainmast replaced by pole mast further forward. Superstructure added aft and crane fitted at after funnel. 4—5-in. guns fitted abreast bridge.

UNITED STATES.

SCOUT CRUISERS.

"*Omaha*" *Class.*

Cincinnati. Concord. Raleigh. Detroit. Richmond. Marblehead. Trenton. Memphis. Omaha.

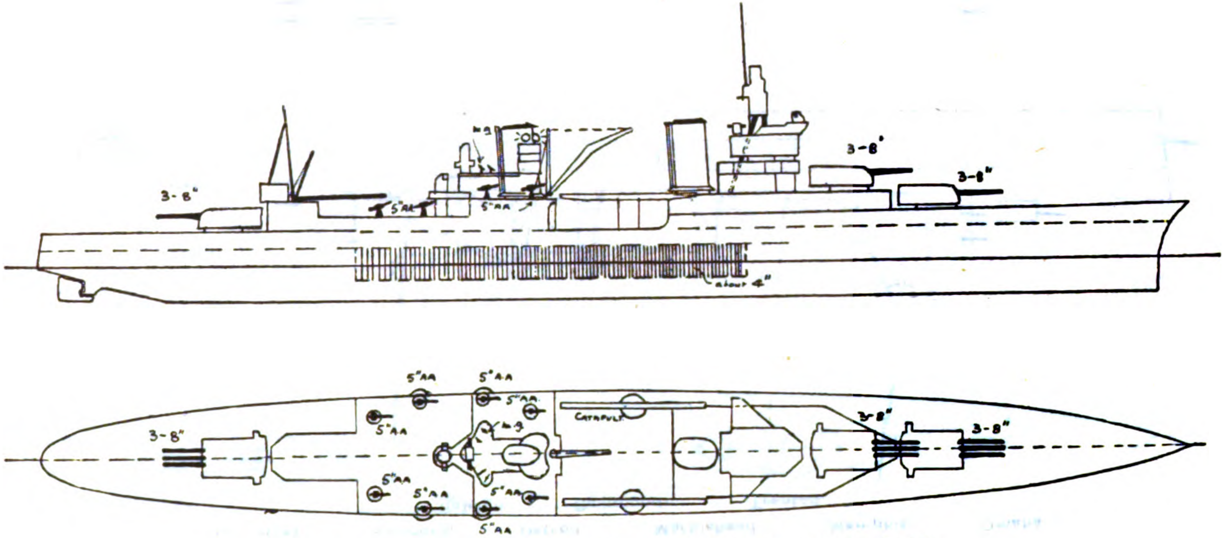


Length (extreme), 555 ft. 6 ins.; Length W.L., 550 ft.; Speed, 33 knots; 7,050 tons; Completed in 1923-25.
Armament, 10—6-in.; 8—3-in.; several small A.A.; 2 triple above-water 21-in. torpedo tubes; 2 catapults; 2 aeroplanes; 30 mines.
Corrections to plan.—The pair of single 6-in. guns at upper deck level aft have been removed. Topgallant masts removed and topmasts shortened.

UNITED STATES.

CRUISER.

Portland.



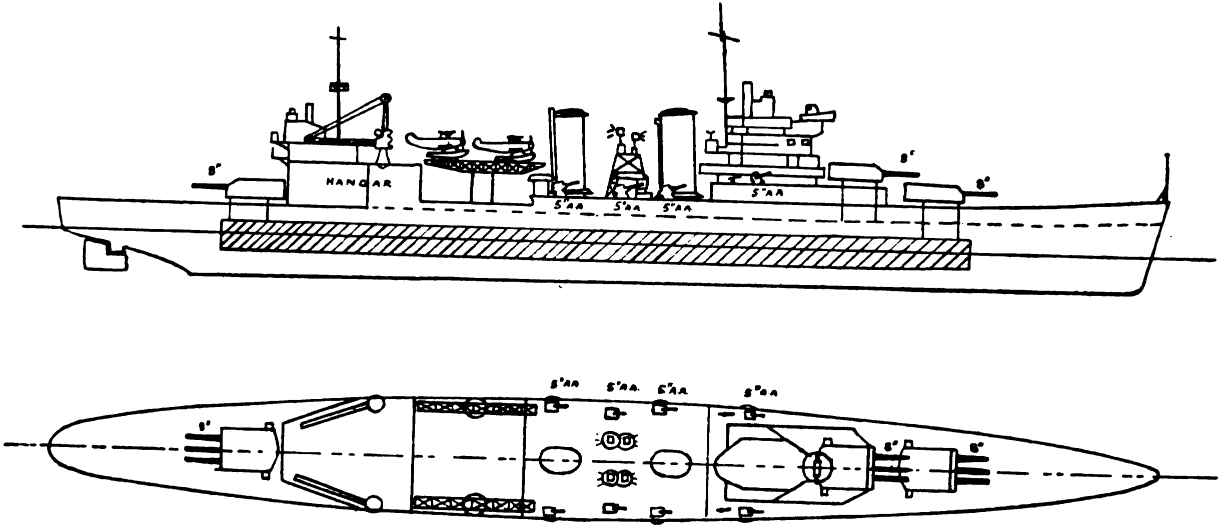
Length (extreme), 610 ft. 3 ins.; 9,800 tons; Speed, 32·7 knots. Completed, 1933.
Armament, 9—8-in., 8—5-in. A.A.; many small A.A. guns; 2 catapults; **4–6 aircraft.**
Corrections to plan.—Mainmast moved to fore side of after funnel.

UNITED STATES.

CRUISERS.

"New Orleans" Class.

New Orleans. San Francisco. Minneapolis. Tuscaloosa.

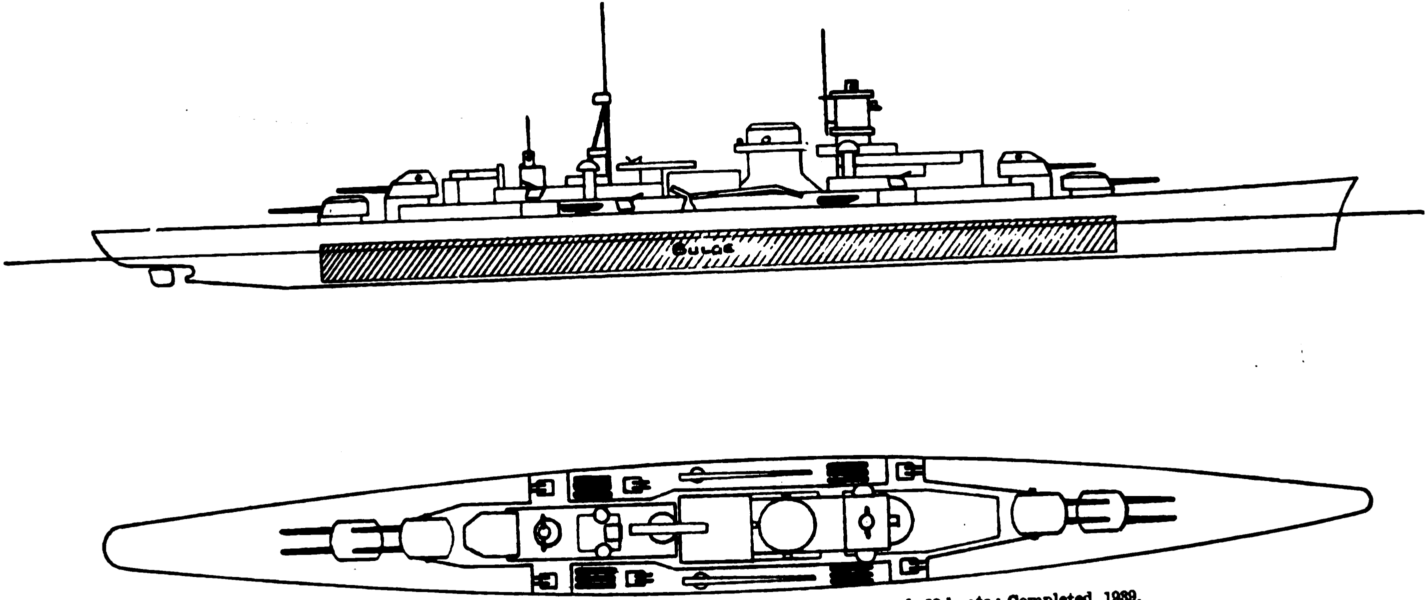


Length (extreme), 588 ft.; on W.L., 574 ft.; 9,950 tons; Speed, 32·7 knots; Completed, 1934–36. Armament, 9—8-in., 8—5-in.; many small A.A. guns; 2 catapults; 4 aircraft.

EX-GERMAN.

CRUISER.

Prinz Eugen.



Length (on W.L.), 639 ft. 9 ins. : Standard displacement, 10,000 tons ; Speed, 32 knots : Completed, 1939.
Armament, 8—8 in. ; 12—4·1 in. A.A. ; 12—1·45 A.A. ; 12—21-in. torpedo tubes ; 1 catapult ; 3 aircraft.
Stem is upright.

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a.a.cr. anti-aircraft cruiser; *a.cr.* armoured cruiser; *a.g.* armoured gunboat; *air.c.* aircraft carrier; *air.cr.* aircraft cruiser; *air.t.* aircraft tender; *air.tr.* aircraft transport; *a.s.* armoured ship; *a.t.* aviation transport; *b.* battleship; *b.cr.* battle cruiser; *c.d.* coast defence ship; *cr.* cruiser; *cr.m.l.* cruiser minelayer; *d.* destroyer; *f.cl.d.* first-class destroyer; *f.cl.t.b.* first-class torpedo-boat; *f.l.* flotilla leader; *l.cr.* light cruiser; *l.f.c.* light fleet carrier; *m.l. & t.s.* minelaying and training ship; *s.cl.d.* second-class destroyer; *s.cr.* scout cruiser; *sea-p.c.* seaplane carrier; *tr.cr.* training cruiser.

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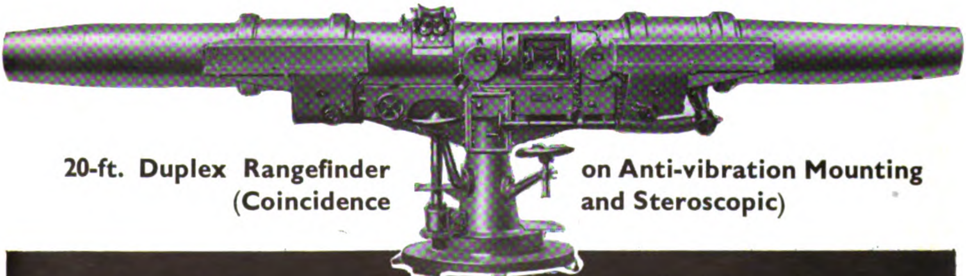

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